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No. 16,780 ✓

**United States Court of Appeals  
For the Ninth Circuit**

HARRY P. LOCKLIN and ELMER J. BRANT,  
general partners doing business under  
the firm name of RADIANT COLOR COM-  
PANY,

*Appellants,*

vs.

SWITZER BROTHERS, INC., a corporation,

*Appellee.*

*See also  
Vols. 3181  
3182*

**MOTION FOR LEAVE TO FILE  
SECOND PETITION FOR REHEARING  
and  
SECOND PETITION FOR REHEARING**

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MAR 1 1966

WM. B. LUCK, CLERK



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general partners doing business under  
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PANY,

*Appellants,*

vs.

SWITZER BROTHERS, INC., a corporation,

*Appellee.*

**MOTION FOR LEAVE TO FILE  
SECOND PETITION FOR REHEARING**

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*To the Honorable Judges of the United States Court of  
Appeals for the Ninth Circuit:*

Harry P. Locklin and Elmer J. Brant, general partners doing business under the firm name of Radiant Color Company, appellants above-named, respectfully move this Court for leave to file the annexed Second Petition for Rehearing the judgment of this Court filed and entered on November 16, 1961 upon its opinion reported as *Locklin v. Switzer Brothers, Inc.* (9 Cir. 1961), 299 F. 2d 160. An earlier order of this Court filed December 26, 1961, denied a Petition for Rehearing filed December 15, 1961, raising the same issue as that which is raised in the annexed Second Petition for Rehearing.

Rehearing is sought anew because, as shown in the annexed Petition, the District Court has now entered certain findings of fact, establishing clear error of fact and latent ambiguity in the premises upon which this Court, in its opinion of November 16, 1961, concluded that Switzer's Kazenas patent No. 2,809,954 met the requirements of U. S. Code, Title 35, Section 112.

As shown in the annexed Petition, certain facts and circumstances which Switzer itself brought to the attention of the District Court in response to the mandate handed down upon this Court's decision in *Locklin v. Switzer Brothers, Inc.* (9 Cir. 1965), 348 F. 2d 244, are in direct and irreconcilable conflict with, and render ambiguous, the factual premises upon which this Court based its opinion of November 16, 1961.

The grounds upon which the second petition is based arose after the filing of the original Petition for Rehearing. The judgment of the District Court which this Court reviewed in making its judgment of November 16, 1961, has not yet become final. Proceedings to determine the extent of damages under said judgment are still in the discovery stage and such accounting proceedings have not yet been tried.

Since the judgment which this Court reviewed is thus still interlocutory, this Court has the clear power to entertain the second petition for rehearing under the authority of:

*Simmons Co. v. Grier Bros. Co.* (1922), 258 U. S. 82, particularly pages 90-91;

*Marconi Wireless Co. v. U. S.* (1943), 320 U. S. 1, particularly pages 47-48;

*McCullough v. Kammerer Corporation* (9 Cir. 1945), 148 F. 2d 525; and

*Stoody Co. v. Carleton Metals* (9 Cir. 1940), 111 F. 2d 920.

This petition is presented to this Court rather than to the District Court because the District Court has no power to entertain a motion such as this after this Court has reviewed the interlocutory judgment and has handed down its mandate. *Atlas Scraper and Engineering Co. v. Harry A. Pursche* (9 Cir. 1966), ..... F. 2d ....., Appeal No. 19404.

Appellants further move the Court for an order granting them leave to file their second petition for rehearing exceeding five pages in length. As appears from the proposed second petition for rehearing which follows this motion and from the attached affidavit, the nature and the factual complexity of the issues has made it impossible to limit the proposed petition to five pages and yet adequately tender the issues to this Court.

Appellants respectfully request, should this motion be denied, that such denial should grant appellants the privilege to present an appropriate motion to the District Court for reconsideration or rehearing the question of whether the claims of Switzer's Kazenas patent do meet the requirements of U. S. Code, Title 35, Section 112 in the light of the District Court's present findings of fact and conclusions of law filed February 17, 1966.

CARL HOPPE,  
*Attorney for Appellants  
and Petitioners.*

State of California  
City and County of San Francisco—ss.

Carl Hoppe, being first duly sworn, deposes and says:

1. Affiant is one of the attorneys of record for appellants and petitioners in the foregoing motion for leave to file second petition for rehearing.

2. Affiant prepared the foregoing motion as well as the proposed second petition for rehearing and knows the contents of each.

3. The matters set forth in the following paragraphs of this affidavit which matters are referred to in the motion and proposed petition are true of affiant's own knowledge.

4. The judgment of the District Court which this Court reviewed in making its judgment of November 16, 1961 has not yet become final.

5. Proceedings to determine the extent of damages under said judgment are still in the discovery stage and such accounting proceedings have not yet been tried.

6. The nature and the factual complexity of the issues has made it impossible for affiant to limit the proposed petition to five pages and yet adequately tender the issues to this Court.

7. Appendices A, B, C, D and E attached to the proposed second petition for rehearing are true and correct copies of the documents or papers which they purport to represent.

CARL HOPPE

Subscribed and sworn to before me this 11th day of March, 1966.

(Seal)

G. S. WEBSTER

Notary Public in and for the City and  
County of San Francisco, State of  
California. My commission expires  
Oct. 31, 1969.



No. 16,780

# United States Court of Appeals For the Ninth Circuit

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HARRY P. LOCKLIN and ELMER J. BRANT,  
general partners doing business under  
the firm name of RADIANT COLOR COM-  
PANY,

*Appellants,*

vs.

SWITZER BROTHERS, INC., a corporation,

*Appellee.*

## SECOND PETITION FOR REHEARING

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*To the Honorable Judges of the United States Court of  
Appeals for the Ninth Circuit:*

Most respectfully, Harry P. Locklin and Elmer J. Brant, general partners doing business under the firm name of Radiant Color Company, appellants above-named, petition this Court to grant a rehearing of the above-entitled cause with respect to its opinion handed down November 16, 1961, and reported at 299 F. 2d 160 on the grounds set forth in this Petition.

1. One of the important issues which appellants raised on the original appeal was that Switzer's Kazenas Patent No. 2,809,954 did not comply with that provision of U. S. Code, Title 35, Section 112 which provides:

"The specification shall conclude with one or more claims *particularly* pointing out and *distinctly* claiming the subject matter which the applicant regards as his invention." (Emphasis added.)

2. Appellants based their contention upon the premise that the language of the Kazenas claims that the amount of melamine is an amount "sufficient to render said condensation product substantially insoluble in aromatic hydrocarbon solvents" did not fulfill the mandate of the statute.

3. In overruling appellants' contention on that statutory defense, the District Court made the determinations set forth in its opinion of September 4, 1959, a copy of which is attached to this petition as Appendix A. On this specific defense, the District Court said among other things:

"... The expression of the maximum and minimum melamine content in functional terms limits the claims to the exact scope of the invention. Indeed, the functional expressions define the limits of the invention more precisely than would have been practically possible by wholly mathematical expressions."

4. In overruling appellants' contention on that statutory defense, this Court, in its opinion of November 16, 1961, made the determinations set forth in its opinion, a copy of which is attached to this petition as Appendix B. With specific reference to the functional limitation as defining invention over the prior art Japanese patent, this Court particularly noted that the District Court "carefully considered the Japanese patent and, apparently relying on the testimony of Dr. Hatcher with respect to his experiments on this patent", concluded that the Japa-

nese resin differed from the Kazenas resin "in at least one vital respect in that it is soluble in aromatic hydrocarbons, while the Kazenas resin is substantially insoluble."

In overruling the statutory defense, this Court recognized that "the novelty for which Switzer contends is that this resin is both thermoplastic and insoluble . . .", and relieved Switzer from the alternative "to state the critical lower limits precisely" because:

" . . . The critical point remains the same for each melamine compound used. It simply is not specified. But whether specified or unspecified the scope of the claim is precisely that of the invention."

\* \* \* \* \*

" . . . There is testimony to the effect that 'sufficient melamine to render the resin substantially insoluble' is a simple, clear test for an ordinary chemist to perform and one which does not require extensive experimentation in order that the precise critical limits be ascertained in a particular case. . . ."

5. The testimony of Dr. Hatcher with respect to his experiments upon the Japanese patent and the Kazenas resin, as well as all portions of his testimony having any bearing upon the contested statutory issue, are abstracted from the original record on appeal and are reproduced as Appendix C attached to this petition. In summary, the testimony of Dr. Hatcher shows that:

A. His experiments for determining whether the resin was substantially insoluble in aromatic hydrocarbon solvents consisted solely of a single series of tests in which he ground the prior art resin and the Kazenas Example 5 resin and placed them in pure toluene in August 1958, and demonstrated the agglomeration of the prior art resin and the free flowing characteristics of the Kazenas Example 5 resin to the District Court in January 1959, an elapsed time of about four and one-half months.

B. The only language in the patent specification which even suggests that the Kazenas resin contained sufficient melamine to render the resin substantially insoluble in aromatic hydrocarbons is:

“ . . . The new resin is insoluble in many common vehicles and can therefore be suspended in such vehicles without coalescence or agglomeration.”

\* \* \* \*

“The pigments prepared in the manner described in the foregoing examples are insoluble in water and aliphatic hydrocarbon solvents, are practically insoluble in aromatic hydrocarbon solvents, and are soluble in ketones and solvent esters. . . .”

\* \* \* \*

“Based on these physical characteristics, the pigments may be used in vehicles which are non-solvents for the pigments to form various types of inks and the like. . . .”

6. After this Court denied the earlier Petition for Rehearing, and after the Supreme Court denied a petition for the writ of certiorari and denied rehearing, appellants adopted one form of substitute resin for the adjudicated resin. While the accounting proceedings were still pending, Switzer brought proceedings to have appellants declared in contempt of court because of their manufacture and sale of that substitute resin. Such proceedings resulted in a contempt judgment which this Court set aside in *Locklin v. Switzer Brothers, Inc.* (9 Cir. 1965), 348 F. 2d 244. The opinion of the Court is attached to this petition as Appendix D. In its opinion, this Court remanded the matter

“ . . . with instructions that the order of the District Court be set aside and that trial be had upon the sole question whether, in the 4-C resin, the amount of melamine utilized is such as to bring the resin within the limits of the claims of the Kazenas patent as those claims are delineated in our former opinion.”

7. After this Court handed down its mandate on said last appeal, and after trial on the merits, the District Court entered findings of fact and conclusions of law incorporated in a written memorandum decision filed February 17, 1966 and reproduced as Appendix E attached to this Petition.

8. On its face, the facts found by the District Court on February 17, 1966, demonstrate that the premises upon which the District Court based its decision of September 4, 1959 and upon which this Court based its opinion of November 17, 1961, were contrary to fact in some respects and latently indefinite in other respects, all as are set forth below:

A. This Court in its opinion relied upon the premise that once the resin is finely ground, it must remain insoluble in aromatic hydrocarbon solvents and in a state of free flowing suspension. This premise underlies the following determination of this Court:

“... The resin must be capable of being finely ground. Once ground, it must remain insoluble in common paint vehicles or solvents and in a state of free flowing suspension.”

\* \* \* \* \*

“The Kazenas patent is for a resin which is a condensation of all three of these chemical components and which is thermoplastic but still is capable of being finely ground and which remains insoluble without agglomeration in aromatic hydrocarbon solvents.”

\* \* \* \* \*

“... If the fact was that the resin would agglomerate and would not remain free flowing, Radiant could have established this by its own pre-trial experiments and have introduced evidence with respect to those experiments at the proper time. . . .”

aromatic hydrocarbon solvent as a constituent. With respect to this, the District Court now finds:

“Further, the testing of a resin in any pure aromatic hydrocarbon solvent is merely an indication of the substantial insolubility of the resin in a paint vehicle.

“The mere fact that resin agglomerates within four or more weeks in a pure hydrocarbon solvent, such as benzene, does not necessarily indicate that the resin will agglomerate in a paint vehicle in the same period of time. Pure hydrocarbon solvents are never used alone with resin in a paint vehicle, but only in conjunction with other liquids and substances which in effect reduce the strength of the pure solvent.

“Thus, in a paint vehicle the resin will actually remain insoluble for a considerably longer period of time than in a pure solvent.

“As demonstrated at trial by Switzer, resins made up in accordance with the examples in the Kazenas patent have remained free-flowing and dispersable in the paint vehicles for longer than five years (RT 109-113).”

9. These facts clearly demonstrate that the claims of the patent fail to particularly point out and distinctly claim the invention in the following respects:

(a) The claims do not state whether the test for “substantially insoluble” should be qualitative or quantitative and the District Court after a full hearing was unable to make a definitive determination as to “the minimum standard for determining the question presented.”

(b) With respect to a qualitative definition, the claims do not state how long the resin must remain “substantially insoluble.” The District Court felt compelled to accept a lapse of time between the date when the powdered resin was placed in toluene and



the date when the observations of the condition of the resin in the toluene were made of less than one week, whereas for purposes of validity, the District Court in the first instance relied upon a period of several months.

(c) With respect to qualitative tests, the claims do not state whether "substantially insoluble" is a matter of substance or a matter of mere form. The District Court in the last instance found that all resins of this type will eventually agglomerate in any pure aromatic hydrocarbon solvent, whereas this Court in its original opinion found that the resins had to remain free flowing in aromatic hydrocarbon solvents.

(d) With regard to quantitative tests, the claims do not state any definite quantity of solubility which would be "substantially insoluble." The District Court did not adopt any definite or distinct quantity as defining the difference between the prior art Japanese resin and the patented resins with respect to substantial insolubility and Dr. Hatcher did not testify in this area at all on the original trial.

(e) It now appears that the words "aromatic hydrocarbon" are not definite. The District Court found it necessary on the contempt proceedings to vary the ordinary meaning of the words "aromatic hydrocarbon solvents" by giving benzene different treatment than other aromatic hydrocarbon solvents—although benzene has been recognized as being the parent of all aromatic hydrocarbon solvents.

(f) It now appears that the word "solvents" is indefinite. In construing the term "aromatic hydrocarbon solvents" in the claims, the District Court found it necessary to distinguish solvents from common paint vehicles.

10. The facts thus newly found and the deviations from the original opinions now found essential to construe the claims establish, appellants submit, that the claims do not particularly and distinctly claim the invention and warrant a reversal of the original findings and determinations that such claims do comply with the statute. This conclusion is supported by the following cases:

*United Carbon Co. v. Binney Co.* (1942), 317 U. S. 228;

*Standard Brands v. Yeast Corp.* (1939), 308 U.S. 34, at page 38;

*Barkeij v. Lockheed Aircraft Corp.* (9 Cir. 1954), 210 F. 2d 1, cert. den. (1954), 348 U. S. 847, reh. den. (1954), 348 U. S. 884;

*Vitamin Technologists v. Wisconsin Alumni Research F.* (9 Cir. 1944, as amended 1945), 146 F. 2d 941, cert. den. (1945), 325 U. S. 876, reh. den. (1945), 326 U. S. 804;

*Jones Knitting Corp. v. Morgan* (E.D.Pa. 1964), 244 F. Supp. 219, at pages 222-224;

*McCulloch Motors Corporation v. Oregon Saw Chain Corp.* (S.D.Cal.C.D. 1964), 234 F. Supp. 256, at pages 258-259;

*Marshall v. Procter & Gamble Manufacturing Company* (D.Md. 1962), 210 F. Supp. 619, at pages 630-631; and

*Armco Steel Corp. v. United States Steel Corp.* (W.D.Pa. 1962), 203 F. Supp. 654, at pages 656-657.

Although the *United Carbon*, *Barkeij* and *Vitamin Technologists* cases were cited in Appellants' Opening Brief, in No. 16,780, pages 90-95, Switzer made no effort to distinguish any of them in its Brief for Defendant-Appellee and this Court, quite understandably, in view of Switzer's contentions then made, did not in its opinion



foresee the latent ambiguities inherent in the Kazenas claims making such cases applicable. *Standard Brands* is newly cited authority urged as being pertinent to indefiniteness now exposed by the experimentation which is necessary to define the invention as now presented by Switzer. The remaining cases all came down after this Court's decision of November 16, 1961.

The facts now found on the contempt matter and made in the light of Switzer's present contentions, certify that the latent ambiguities create a real uncertainty of claim language in violation of the statute. The mere fact that the claim language is susceptible of the shifting and variable interpretations now manifest in the several opinions proves that the claims are not definite.

11. This petition for rehearing is based solely upon the face of the opinion below and does not attack the opinion on the merits. On the merits, the decision below will be made the subject matter of an independent appeal.

For the foregoing reasons, petitioners respectfully pray that this, their second petition for rehearing, be granted and that this Court grant reargument on the question of whether the claims conform with 35 U.S.C. 112 in the light of the findings which the District Court has just made. In the alternative and if this second petition for rehearing be denied, petitioners pray that the denial grant them the privilege to file a motion for reconsideration of this issue in the District Court so that the matter of statutory compliance may there be redetermined in the light of the facts brought out in the most recent opinion of the District Court.

Respectfully submitted,

CARL HOPPE,

*Attorney for Appellants  
and Petitioners.*

## CERTIFICATE OF COUNSEL

I, Carl Hoppe, attorney for Appellants, do hereby certify that the foregoing petition for a rehearing of this cause is presented in good faith and not for purpose of delay.

CARL HOPPE.

**(Appendices Follow)**

## **Appendices.**

leged infringement of the patent by Plaintiffs and prayed for an injunction and damages.

The patent in suit, issued on October 15, 1957 to Zenon Kazenas and assigned to Defendant, is for a thermoplastic melamine-sulfonamide-formaldehyde resin and the process for making such resin. The Kazenas resin has a combination of properties that make it particularly useful for the manufacture of pigments. It is friable and readily grindable into a finely divided condition. It does not agglomerate during grinding inasmuch as it does not exhibit cold flow at room temperatures, [1] and does not soften below 100° C. It is insoluble in common paint solvents such as aliphatic and aromatic hydrocarbons, and hence, can be suspended in such vehicles without coalescence or agglomeration. Yet it is soluble in ketones in which it can be dissolved to form coating compositions. When employed with certain fluorescent dyes in a pigment, the resin imparts superior light-fastness to the pigment.

The ingredients employed by Kazenas to make his resin had previously been in common use in the manufacture of resins, but they had not theretofore been combined in the manner disclosed in the Kazenas patent. Melamine had commonly been reacted with formaldehyde to make melamine aldehyde resins while sulfonamide had commonly been separately reacted with formaldehyde to make sulfonamide-aldehyde resins. The melamine-aldehyde resins are thermoset resins, that is, once having been set by heat, they are infusible upon further heating. The sulfonamide-aldehyde resins are thermoplastic, that is, capable of being fused or softened by heat. The thermoset melamine-aldehyde resins are so hard and tough that they are difficult to grind and are insoluble in aromatic and aliphatic hydrocarbons and in ketones. The thermoplastic sulfonamide-aldehyde resins have such a low melting point that they tend to agglomerate upon grinding and they are

soluble in aromatic and aliphatic hydrocarbons and in ketones.

Prior to the disclosures of the Kazenas patent, it was understood by those skilled in the art of making resins, that melamine, sulfonamide, and formaldehyde were compatible in combination and that melamine-aldehyde resins could be modified by adding sulfonamide while sulfonamide-aldehyde resins could be modified by adding melamine. But, the literature introduced to show the state of the prior art, contains very meager teachings regarding particular combinations of melamine, [2] sulfonamide, and formaldehyde that would produce specific results.

Plaintiffs concede that the Kazenas patent is not anticipated by any resin in the prior art, but it is contended that the Kazenas resin is not such an advance over the prior art as to constitute invention.

Of the prior art references cited by Plaintiffs, two relate to the modification of melamine-aldehyde resins by the addition of sulfonamide. One is the Widmer and Fisch Patent No. 2,197,357 for aminotriazine-aldehyde condensation products in which melamine is one of the preferred aminotriazines employed. The specification states that it is not necessary to use aminotriazine alone in the condensation, and that other compounds capable of forming resins with aldehydes, such as sulfonamides, may be added. The specification goes on to list a variety of properties which may be exhibited by the condensation products depending upon the parent material selected and the conditions of the reaction. But, nowhere is there any intimation regarding the result that might be anticipated if sulfonamide were introduced in the condensation of melamine and formaldehyde. It is obvious that the Widmer-Fisch patent is of little consequence in appraising the Kazenas resin as an invention.

The other reference relating to the modification of melamine-aldehyde resins by sulfonamides is an article by Bergen and Craver in the September, 1947 issue of Industrial and Engineering Chemistry entitled "Sulfonamide Plasticizers and Resins". This article discusses generally the preparation, properties, and applications of sulfonamide plasticizers and resins. At one point, it comments that "Although the limits of compatibility are not shown here, it is known that the sulfonamides are compatible with, and in some cases actually [3] enter into, the reaction of various thermosetting plastics such as urea-formaldehyde, melamine formaldehyde, and phenol-formaldehyde. Here they impart an increased flow or plasticity, which makes possible laminated punching stock or postformed articles, and decreased molding pressures and temperatures." Further on it states that "The sulfonamides are used by the plastics industry for plasticizing thermosetting resins, such as phenol-formaldehyde, urea-formaldehyde, melamine-formaldehyde, and copolymer-ester-type resins, so that better flow is obtainable and lower temperatures and pressures may be used." The entire import of this disclosure is that a thermosetting melamine-formaldehyde resin, when modified with sulfonamide, will flow at lower temperatures and pressures prior to becoming set, but will retain its character as a thermosetting resin. This disclosure certainly would not suggest the condensation of melamine, sulfonamide, and formaldehyde to obtain a thermoplastic resin such as the Kazenas resin.

The remainder of the prior art references relate to the modification of sulfonamide-aldehyde resins by the addition of melamine. Two of these references, the Bren Patent No. 1,961,579 and the Moss and White Patent No. 1,873,848 on their face, do not deal with the modification of sulfonamide-aldehyde resins with melamine. They de-

scribe modification by addition of urea, thiourea or guanidine. It is plaintiffs' contention that melamine is a chemical so closely analogous to urea, thiourea or guanidine that it could not constitute invention to substitute melamine for any one of the three. In support of this contention, plaintiffs cite a paragraph from Chemical Abstracts for January 20, 1946 which merely notes that a British patent discloses that when certain specified chemicals are heated together with one or more of such substances as urea, thioureas, guanidine, and aminotriazines, [4] decorative or protective film-forming compositions are obtained. Plaintiffs also cite several published judicial opinions. Only two of these opinions are relevant at all, and they lend slim support to Plaintiffs' argument that it would be routine to substitute melamine for urea, thiourea, or guanidine. In *re Berger*, 143 F.2d 971, indicates that melamine-aldehyde resins and urea-aldehyde resins are analogous, but do not function in the same way in all circumstances. In *re West*, 160 F.2d 570, merely suggests that urea, thiourea, and aminotriazines have sufficient common properties to warrant their being characterized as a class in a particular application. It is readily apparent that Plaintiffs' references fall far short of teachings that melamine is so similar to urea, thiourea, or guanidine that one could substitute it for any one of the three in the making of resins and expect to obtain the same result.

But, even assuming that melamine were regarded in the art as the equivalent of urea, thiourea, and guanidine, the Bren patent and the Moss-White patent describing the modification of sulfonamide-aldehyde resins by addition of these substances would not suggest that the addition of melamine to a sulfonamide-aldehyde resin would produce a resin with the properties of the Kazenas resin. The Bren patent merely discloses that the formation of bubbles



in products molded from a sulfonamide-aldehyde resin can be prevented by adding sufficient urea, thiourea, or guanidine to react with any aldehyde released in gaseous state when the resin is heated.

The Moss-White patent relates primarily to the preparation of a toluene sulfonamide-aldehyde resin compatible with derivatives of cellulose. A modification of this resin with urea is described as follows: [5]

“In another mode of carrying out our invention 5 to 10% of urea as [sic] added to the initial reactants, and the subsequent steps are carried out as already described. We have further found that this resin is not permanently fusible in the way in which this term is commonly used in resin literature. If the improved resin, as herein described, is held at a temperature of 160-200° C., preferably about 175° C, for from 4 to 8 hours, it is converted into a dark, greenish brown resin, which consists almost entirely of two crystalline substances, both of which are largely insoluble in benzene. The exact composition and formula of these substances cannot be given. However, one of them, in the crude state in which it separates from the benzene solution, melts at 140-150° C, whilst the second one melts at 160-162° C., and on recrystallizing from alcohol or xylene it melts sharply at 165° C.”

Plaintiffs contend that this description discloses that the modification of a sulfonamide-aldehyde resin with urea will produce a thermoplastic resin substantially insoluble in aromatic hydrocarbon solvents with a high melting point, similar to the Kazenas resin. But, the Moss-White disclosure is obscure in several respects. It is not at all clear that the statement that the resin “is not permanently fusible” means that it is thermoplastic, for this statement could be taken to mean that the resin is not permanently capable of being melted and is therefore thermosetting. The explanation that the resin consists of



two compounds both largely insoluble in benzene, which separate independently from a benzene solution and individually recrystallize from xylene does not indicate that the described resin is a homogeneous resin, itself, substantially insoluble in aromatic hydrocarbons. Moreover, the described resin differs significantly from the clear Kazenas resin, in that it is a dark, greenish brown. It is not at all reasonable to assume that the Moss-White disclosure would point the way to the Kazenas resin even if melamine were taken to be the equivalent of urea.

The only prior art reference specifically describing the modification of a sulfonamide-aldehyde resin with melamine is the Japanese Patent No. 181,405 for a method of producing a [6] highly waterproof para-toluol-sulfamide resin of a high melting point.

The Japanese patent discloses that the reaction of para-toluol-sulfamide and formalin with a small amount of melamine will produce a resin which has greater waterproofness and a substantially higher melting point than a conventional para-toluol-sulfamide resin, but which retains the other characteristics of such a resin. The Japanese resin, as described in the patent, thus has properties similar to those of the Kazenas resin in that it is thermoplastic and has a relatively high melting point,<sup>1</sup> but it differs in at least one vital respect in that it is soluble in aromatic hydrocarbons, while the Kazenas resin is substantially insoluble. Both the Japanese resin and the Kazenas resin are composed of a sulfonamide, an alde-

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<sup>1</sup>A softening point of 122° C was claimed for the Japanese resin. Yet, Plaintiffs' expert and Defendant's expert testified that upon testing a sample of the Japanese resin prepared by them, they respectively found that it softened at 81° and 89° C. Consequently, if the patentable novelty of the Kazenas resin were dependent upon its melting point, the Court could not accept the Japanese patent as prior art in fact disclosing a method of modifying a sulfonamide-aldehyde resin with melamine to obtain a resin with a high melting point.

hyde, and melamine, but in critically different proportions. The most significant difference is in the amount of melamine. The Japanese patent specifies a "small" amount of melamine which, in the single example set forth in the patent, is 5% by weight of the para-toluol-sulfamide employed. The Kazenas patent teaches the use of a substantial amount of melamine or melamine derivative ranging in amount from 11 to 50% by weight of the sulfonamide. Kazenas also teaches the use of a greater amount of aldehyde in relation to the sulfonamide.

Plaintiffs urge that it did not constitute invention for Kazenas to vary the proportion of melamine and aldehyde to achieve substantial insolubility in aromatic hydrocarbons. But, the Japanese [7] patent, itself, does not even suggest the possibility that a greater proportion of melamine and aldehyde might produce a resin substantially insoluble in aromatic hydrocarbons. Indeed, it would discourage experimentation along these lines. Since the patent states that, except for greater waterproofness and a higher melting point, the Japanese resin does not lose the characteristics of a conventional para-toluol-sulfamide resin, one could only conclude that the modification with melamine does not affect its solubility in aromatic hydrocarbons.

It is possible that the mere fact that melamine-aldehyde resins were known to be insoluble in aromatic hydrocarbons might suggest to a skilled chemist that the modification of a sulfonamide-aldehyde resin with melamine might make the resin less soluble in aromatic hydrocarbons. But, it could not have been anticipated that sufficient melamine could be used to achieve substantial insolubility in aromatic hydrocarbons without simultaneously making the resin thermosetting. Nor, was there any basis for expecting that the reaction of melamine with sulfonamide and an aldehyde would produce a resin having the insolubility in aromatic hydrocarbons characteristic of a melamine-

aldehyde resin, but retaining the ketone solubility characteristic of a sulfonamide-aldehyde resin.

The sum and substance of the teachings of the prior art, including the Japanese patent, was that the properties of melamine-aldehyde resin could be modified to some extent by adding a small amount of a sulfonamide, and that the properties of a sulfonamide-aldehyde resin could be modified by adding a small amount of melamine. These teachings were narrow ones. They did not constitute such important and substantial discoveries that the ordinary capable chemist could carry on from that point and in normal course produce the Kazenas resin.<sup>2</sup> [8] The Kazenas patent discloses the new and broader concept that melamine and a sulfonamide, each in a relatively substantial quantity, could be reacted together with an aldehyde to produce a distinct resin having some of the properties of a sulfonamide-aldehyde resin, and some of the properties of a melamine-aldehyde resin, and other properties which are unique. The Kazenas resin represented a new arrangement of ingredients that produced a new, unexpected and useful result. The Court is satisfied that it was such an advance over the prior art as to constitute invention.

Apart from their contention that the Kazenas resin did not amount to an invention, Plaintiffs contest the validity of the Kazenas patent on the basis of several claimed defects in the patent itself.

Plaintiffs first urge that because the essence of the Kazenas invention is the relative proportions of the components of his resin, the patent lacks validity in failing to disclose or claim any critical limits. But, Plaintiffs' view could only be sustained by a hypercritical and piecemeal analysis of the patent. The Court is satisfied both

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<sup>2</sup>Aluminum Co. of America v. Thompson Products, 122 F. 2d 796 (6 Cir. 1941); Rohm & Haas Company v. Roberts Chemicals, 245 F. 2d 693 (4 Cir. 1957).

from its own reading of the patent and the expert testimony, that anyone with a modicum of skill in the resin art upon examining the Kazenas patent in its entirety would clearly understand that the relative proportions of melamine, sulfonamide, and aldehyde must be maintained within a limited range in order to produce a resin that would be thermoplastic, have a high melting point, and be substantially insoluble in aromatic hydrocarbons. The Court is further satisfied that the critical range is set forth with sufficient precision that anyone skilled in the art could readily perceive its limits.

Plaintiffs' expert testimony to the effect that the upper and lower limits specified in the patent are not in fact [9] critical was not convincing. Upon cross-examination the testimony of Plaintiffs' expert tended to confirm the teaching of the patent that the melamine component should not exceed 50% by weight of the sulfonamide. The experiments performed by Plaintiffs' expert to test the properties of resin samples prepared in accordance with the examples in the Kazenas patent, in the opinion of the Court, are not reliable evidence to support Plaintiffs' contention that as one approaches the lower limit of the critical range within which the melamine content may be varied the proportion of melamine is inadequate to produce the aromatic hydrocarbon insolubility claimed by the patent. These experiments were limited in number. Some of the examples were admittedly not carried out strictly in accordance with the instructions. Some of the experiments which were repeated had inconsistent results that were not satisfactorily accounted for. There is an unexplained inconsistency in the testimony that the sample of example 3 was insoluble in toluene while the sample of example 4 was not although both examples call for an almost identical proportion of the melamine component.

Several asserted defects in the claims are contended by Plaintiffs to invalidate the Kazenas patent. It is urged

that the claims are void because the maximum and minimum limits of the melamine compound are expressed partially in functional terms. The language complained of is that which states that the melamine compound should be "sufficient to render said condensation product substantially insoluble in aromatic hydrocarbon solvents but insufficient to render it thermosetting." Plaintiffs cite a multitude of cases in support of the argument that this functional expression invalidates the claims. But, none of these cases holds that claims employing functional expressions to define the claimed invention are per se invalid. In all of the cases relied upon by Plaintiffs the claims were [10] disapproved because under the particular circumstances the use of functional expressions either left the description of the invention too vague or made the claim broader than the invention. The functional expressions employed in the Kazenas claims do not have either of these objectionable results. When the general description, the specific examples, and the claims are read together, the invention is so plainly defined that no one skilled in the art should have any difficulty in practicing it. The expression of the maximum and minimum melamine content in functional terms limits the claims to the exact scope of the invention. Indeed, the functional expressions define the limits of the invention more precisely than would have been practically possible by wholly mathematical expressions.

Plaintiffs also urge that the inclusion in the claims of the expression that the amount of melamine compound is "sufficient to render said condensation product substantially insoluble in aromatic hydrocarbon solvents" invalidates the claims because the minimum melamine proportion is not described in the specification. This is simply a restatement of the argument that it was improper to claim the minimum melamine content in functional terms. For, as has been noted, it would be



objectionable to claim an element of an invention in functional terms if the result was that such element was inadequately described in the specification. But, it would be readily apparent to anyone skilled in the art from the description of the invention that a sufficient quantity of melamine would be just as essential to achieve aromatic hydrocarbon insolubility as it would be to obtain the high melting point which is specifically stated to be dependent upon adequate melamine. The specification affords an adequate guide as to what this minimum quantity should be. The general description and the specific examples teach that the melamine component content may [11] be varied from 11 to 50 per cent by weight of the sulfonamide component depending upon the particular form of melamine component employed. It is stated that the preferred amount of unmodified B-state melamine-aldehyde resin, the form of melamine component to be used most sparingly, is one-fifth or 20% by weight of the sulfonamide component. The tenor of the description as a whole is that a fairly substantial amount of melamine component should be used. In this context, examples two and five, in which the specified amount of melamine is respectively 11% and 13% by weight of the sulfonamide component, constitute an adequate guide as to the minimum amount of melamine that will be effective to render the resin substantially insoluble in aromatic hydrocarbons.

Plaintiffs further contend that the language that the amount of melamine compound is "sufficient to render said condensation product substantially insoluble in aromatic hydrocarbon solvents" invalidates the claims because it was added by amendment to the patent application without being supported by a supplementary oath and after intervening rights had accrued. There is no merit to this argument because the language complained of did not constitute new matter. The general description and the specific examples were included in the original appli-

cation in substantially the same form as they appear in the patent. As has been previously stated, anyone skilled in the art could readily perceive from the general description and the examples that there would be a minimum amount of melamine necessary to render the resin substantially insoluble in aromatic hydrocarbons, even though the description does not say so in so many words. And, the description and examples sufficiently demonstrate what the minimum amount is.

Plaintiffs attack the validity of a number of the [12] Kazenas claims which claim a large class of melamine components and a large class of sulfonanide components on the ground that defendant has not shown that all of the members of each class are operable. But Plaintiffs have cited no authority and the Court is aware of none that places such a burden on the defender of a patent. In all of the cases cited by Plaintiffs some members of the class of compounds embraced by claims held to be invalid were in fact shown to be inoperative. Plaintiffs introduced no evidence showing that any members of the classes of compounds within the scope of the Kazenas claims are inoperative nor even any evidence that would suggest that some might be inoperative. Merely because the classes of components claimed are large ones is no basis for assuming that some of their members are inoperative.

The Court concludes that there is no invalidity in the Kazenas patent.<sup>3</sup> In respect to the issue of infringement, the record clearly sustains the contention of Defendant that Plaintiffs have infringed claims 1-4 and claim 9 of the Kazenas patent. [13]

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<sup>3</sup>Since the Court has concluded that the Kazenas resin is not dependent for patentable novelty upon the fact that it is completely condensed, it is unnecessary to discuss Plaintiffs' argument that patentable novelty may not be predicated upon that feature of the Kazenas resin.

## Appendix B

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Opinion of the Court of Appeals for the Ninth Circuit  
filed November 16, 1961, as reported in 299 F.2d 160.

Harry P. LOCKLIN and Elmer J. Brant, General partners doing business  
under the firm name of Radiant Color Company, Appellants,

v.

SWITZER BROTHERS, INC., a corporation, Appellee.

No. 16780.

United States Court of Appeals  
Ninth Circuit.

Nov. 16, 1961.

Rehearing Denied Dec. 26, 1961.

Certiorari Denied April 23, 1962.

See 82 S.Ct. 950.

Action for determination that Patent No. 2,809,954 for resin useful in manufacture of pigments and for process of obtaining that resin was invalid and not infringed, wherein patentee counterclaimed charging infringement. The United States District Court for the Northern District of California, Southern Division, Louis E. Goodman, Chief Judge, ruled that patent was valid and infringed and appeal was taken. The Court of Appeals, Merrill, Circuit Judge, held that fact that some preliminary testing was required to determine proper portion of substance to be used to produce resin did not render claim invalid, where it appeared that amount needed could be determined by simple clear test not requiring extensive experimentation, and that patent was valid and infringed.

Affirmed.

### 1. Patents (Key) 20

Test in determining whether varying of proportions can constitute invention is whether it brings about mere



improvement in already discovered result, or accomplishes new and unexpected result.

**2. Patents (Key) 118.3**

Claim must be sufficiently clear to allow others to reproduce result at end of monopoly period and to enable contemporary inventors to ascertain whether or not they are infringing.

**3. Patents (Key) 118.8**

That some preliminary testing was required to determine proper portion of substance to be used to produce patented resin did not render claim invalid, where it appeared that amount needed could be determined by simple clear test not requiring extensive experimentation.

**4. Patents (Key) 118.6**

That limits of substance to be used in patented chemical product were, in claims, stated in functional language did not render patent invalid.

**5. Patents (Key) 314**

Whether steps followed by chemist, who reproduced patented product, were of type requiring expert as distinguished from ordinary industrial chemist was for trial court.

**6. Patents (Key) 109**

Where feature of insolubility of resin useful in manufacture of pigments was disclosed in specification of original application, although its bearing upon critical limit of amount of melamine to be used was not expressed, and amendment stated limitation implicit in specifications, but not explicit in claims themselves, no intervening public rights attached to insolubility feature of patent and no supplemental oath was required. 35 U.S.C.A. § 112.

**7. Patents (Key) 118.17**

Defender of patent for resin useful in manufacture of pigments was not required to establish effectiveness of each member of broad class of melamine derivatives that would be effective to produce alleged novel result.

**8. Patents (Key) 328**

Patent No. 2,809,954 for resin useful in manufacture of pigments and for process of obtaining that resin was valid and infringed.

**9. Federal Civil Procedure (Key) 2016**

Rejection of new matters of evidence sought to be introduced in post-trial proceedings was discretionary.

**10. Federal Civil Procedure (Key) 2016**

Time for testing of proof is time for trial and rights of litigants cannot be held in abeyance in order that hindsight may provide more accurate appraisal of evidence.

**11. Patents (Key) 315**

Denial of new trial, sought by party found to be patent infringer, upon ground of unclean hands, and refusal to delay judgment in order that hearing might be had on newly tendered issues was discretionary.

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Carl Hoppe and James F. Mitchell, San Francisco, Cal., for appellants.

Flehr & Swain by John F. Swain, San Francisco, Cal., for appellee, Hill, Sherman, Meroni, Gross & Simpson, by Benjamin H. Sherman and Richard M. S. Manahan, Chicago, Ill., of counsel.

Before BARNES, JERTBERG and MERRILL, Circuit Judges.

MERRILL, Circuit Judge.

Appellants, doing business in California as Radiant Color Company, are manufacturers of fluorescent paints. They have taken this appeal from a judgment determining that they have infringed a patent held by appellee. The parties hereafter shall be referred to as "Radiant" (appellants) and "Switzer" (appellee).

Suit was originally brought by Radiant. It had been notified by Switzer that certain of its pigments infringed Switzer's resin patent number 2,808,954. This action was brought seeking declaratory relief: a determination that the patent in question was invalid and was not infringed. Switzer counterclaimed, charging Radiant with infringement and asking injunctive relief. The district court ruled that the patent was valid and infringed and granted Switzer relief in accordance with these determinations.

The patent in question was issued October 15, 1957, to Zenon Kazenas and subsequently was assigned to Switzer. It is for a resin useful in the manufacture of pigments and for the process of obtaining that resin. A preliminary consideration of the characteristics and chemical components of such resins is essential to any discussion of the issues presented by this appeal.

Such resins are classified industrially as "thermosetting" and "thermoplastic." A thermosetting resin is one which, upon heating in a mold, hardens to form an infusible "thermoset" resin that no longer can be softened or fused by heating. A thermoplastic resin, in contrast, can be softened or fused by heat repeatedly.

For resins satisfactorily to be incorporated into pigments, certain characteristics are important. The resin must be capable of being finely ground. Once ground, it

must remain insoluble in common paint vehicles or solvents and in a state of free flowing suspension.

Thermo setting resins, being tough and hornlike, are generally difficult to grind. Thermoplastic resins generally are also difficult to grind due to their tendency to ball up or "agglomerate" at the temperatures encountered during grinding. Furthermore, they generally do not remain in a free flowing state of suspension in common paint vehicles, but again tend to agglomerate.

We are here concerned with three chemical components: melamines, sulfonamides and aldehydes. These components and their characteristics were discussed in some detail by Dr. David B. Hatcher, an expert witness called by Switzer.

Melamine and sulfonamide are basic resin ingredients. Aldehyde was described as "the linker, you might call it the glue, between the larger molecules" of melamine or sulfonamide. Where melamine alone is reacted with an aldehyde, the result is a "self-condensed" resin, the molecules of melamine condensing with each other through reaction with the aldehyde. Similarly, a sulfonamide-aldehyde resin is a self-condensation. "Co-condensation" occurs where two unlike molecules are reacted together.

Dr. Hatcher testified, "Normally, melamine is resistant to co-condensation. It has a tendency to condense with itself so that most efforts to co-condense it are unsuccessful. What results is not a single resin resulting from co-condensation \* \* \* but a mixture of self-condensed resins." Further, melamine resins are normally thermoset with considerable strength and resistance to crumbling and breaking.

Sulfonamide resins, on the other hand, are normally thermoplastic and soluble in aromatic solvents.

The Kazenas patent is for a resin which is a co-condensation of all three of these chemical components and which

is thermoplastic but still is capable of being finely ground and which remains insoluble without agglomeration in aromatic hydrocarbon solvents.<sup>1</sup>

Upon this appeal Radiant attacks the validity of the Kazenas patent upon five separate grounds.

The first issue is presented by Radiant's contention that the Kazenas patent is lacking in patentable novelty. The prior art upon which Radiant mainly relies is a Japanese patent, the Matsuo and Nitta Patent No. 181,405, issued in 1950. This patent, Radiant asserts, discloses a thermoplastic resin made by co-condensing formaldehyde, sulfonamide and melamine.

The district court carefully considered the Japanese patent and, apparently relying on the testimony of Dr. Hatcher with respect to his experiments upon this patent, concluded:

“The Japanese resin, as described in the patent, thus has properties similar to those of the Kazenas resin in that it is thermoplastic and has a relatively high melting point, but it differs in at least one vital respect in that it is soluble in aromatic hydrocarbons, while the Kazenas resin is substantially insoluble.”

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<sup>1</sup>Radiant was found to have infringed Claims 1, 2, 3, 4 and 9 of the Kazenas patent. Claim 2 is typical. It provides:

“A completely condensed, thermoplastic resin consisting essentially of the condensation product of at least one aldehyde component entirely selected from the class consisting of formaldehyde and paraformaldehyde, at least one aromatic monosulfonamide having two reactive amide hydrogens, where the sulfonamide group is attached directly to the aromatic nucleus through the sulfur atom, and at least one melamine compound selected from the class consisting of melamine, alkyl melamines having no more than one alkyl substituted amido nitrogen, and monohydric Alkanol modified methylol and alkyl methylol melamines, the amount of said melamine compound being an amount, not exceeding 50% by weight of the aromatic monosulfonamide, sufficient to render said condensation product substantially insoluble in aromatic hydrocarbon solvents but insufficient to render it thermosetting.”

The court then pointed out:

“Both the Japanese resin and the Kazenas resin are composed of a sulfonamide, an aldehyde, and melamine, but in critically different proportions. The most significant difference is in the amount of melamine. The Japanese patent specified a ‘small’ amount of melamine which, in the single example set forth in the patent, is 5% by weight of the para-toluol-sulfamide employed. The Kazenas patent teaches the use of a substantial amount of melamine or melamine derivative ranging in amount from 11 to 50% by weight of the sulfonamide. Kazenas also teaches the use of a greater amount of aldehyde in relation to the sulfonamide.”

Radiant contends that a mere varying in proportions cannot constitute novelty and invention and that this is all that the Kazenas patent adds to the Japanese patent.

The general rule as stated in *Smith v. Nichols*, 1874, 21 Wall. 112, 88 U.S. 112, 119, 22 L.Ed. 566, is:

“\* \* \* a mere carrying forward of new or more extended application of the original thought, a change only in form, proportions, or degree, the substitution of equivalents, doing substantially the same thing in the same way by substantially the same means with better results, is not such invention as will sustain a patent.”

In *Greene Process Metal Company v. Washington Iron Works*, 9 Cir., 1936, 84 F.2d 892, 893, this Court held unpatentable a discovery described as follows:

“Greene’s alleged discovery was that the desired result—removal of sulfur and other impurities from iron or steel—might be accomplished more effectively and more economically by increasing the percentage of silica in the slag used for that purpose. \* \* \*”

[1] The test would seem to be whether the varying of proportions brings about a mere improvement in the



already discovered result or, on the other hand, accomplishes a new and unexpected result. In *Application of Aller*, Court of Customs and Patent Appeals, 1955, 42 CCPA S24, 220 F.2d 454, 456, it is stated:

“Normally, it is to be expected that a change in temperature, or in concentration, or in both, would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art. \* \* \* Such ranges are termed ‘critical’ ranges, and the applicant has the burden of proving such criticality. \* \* \* However, even though applicant’s modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within the capabilities of one skilled in the art. \* \* \* More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. \* \* \*”

With reference to Radiant’s contention that the Kazenas patent lacked invention, the district court stated:

“Plaintiffs urge that it did not constitute invention for Kazenas to vary the proportion of melamine and aldehyde to achieve substantial insolubility in aromatic hydrocarbons. But the Japanese patent itself does not even suggest the possibility that a greater proportion of melamine and aldehyde might produce a resin substantially insoluble in aromatic hydrocarbons. Indeed, it would discourage experimentation along these lines. Since the patent states that, except for greater waterproofness and a higher melting point, the Japanese resin does not lose the characteristics of a conventional paratolnol-sulfamide resin, one could only conclude that the modification with melamine does not affect its solubility in aromatic hydrocarbons.

“It is possible that the mere fact that melamine-aldehyde resins were known to be insoluble in aromatic hydrocarbons might suggest to a skilled chemist that the modification of a sulfonamide-aldehyde resin with melamine might make the resin less soluble in aromatic hydrocarbons. But, it could not have been anticipated that sufficient melamine could be used to achieve substantial insolubility in aromatic hydrocarbons without simultaneously making the resin thermosetting.”

The testimony of Dr. Hatcher provides clear support. Emphasizing the overpowering nature of melamine and its tendency to thermoset, he concluded that the Japanese patent would not have led the ordinary chemist to greater experimentation in increasing the proportions of melamine. He discussed the many classes of melamine and sulfonamide compounds. He pointed out that a chemist faced with this multitude of possible components and with the economics of industrial research would actually be discouraged from experimentation along these lines and would tend to accept the original discouraging premise that an increase in melamine would result in thermosetting.

The district court's conclusion upon this issue, with which we agree and which we here adopt, was as follows:

“The sum and substance of the teachings of the prior art, including the Japanese patent, was that the properties of melamine-aldehyde resin could be modified to some extent by adding a small amount of a sulfonamide, and that the properties of a sulfonamide-aldehyde resin could be modified by adding a small amount of melamine. These teachings were narrow ones. They did not constitute such important and substantial discoveries that the ordinarily capable chemist could carry on from that point and in normal course produce the Kazenas resin. The Kazenas patent discloses the new and broader concept that melamine and sulfonamide, each in a relatively substantial



quantity, could be reacted together with an aldehyde to produce a distinct resin having some of the properties of a sulfonamide-aldehyde resin and some of the properties of a melamine-aldehyde resin, and other properties which are unique. The Kazenas resin represented a new arrangement of ingredients that produced a new, unexpected and useful result. The Court is satisfied that it was such an advance over the prior art as to constitute invention."

Radiant's second attack upon the validity of the patent is addressed to the fact that the limits of melamine are expressed in functional language. The claims provide (see footnote 1) that the amount of melamine shall be "an amount \* \* \* sufficient to render said condensation product substantially insoluble in aromatic hydrocarbon solvents but insufficient to render it thermosetting."

Since the novelty for which Switzer contends is that this resin is both thermoplastic and insoluble, Radiant contends that this language violates the rule against the use of functional language at the precise point of novelty. Violation of this rule, Radiant contends, renders the patent invalid.

Many authorities are cited by Radiant in support of its position. As disclosed by these cases, the vice of a description in terms of function is that it may in either of two ways adversely affect the public interest: by broadening the claim beyond the scope of actual invention; or by rendering the description so vague that the actual scope of the patent is not made clearly apparent to those concerned.

General Electric Company v. Wabash Company, 1937, 304 U.S. 364, 58 S.Ct. 899, 902, 82 L.Ed. 1402, dealt with a patent upon a light filament which attacked the problem encountered by prior art that such filaments had a tendency toward "sagging and offsetting" which reduced

the life of the light bulb. The claim prescribed that the filaments should consist of grains "of such size and contour as to prevent substantial sagging and offsetting" during a commercially useful life for the bulb. The court stated in 304 U.S. at page 371, 58 S.Ct. at page 902:

"The claim uses indeterminate adjectives which describe the function of the grains to the exclusion of any structural definition, and thus falls within the condemnation of the doctrine that a patentee may not broaden his product claims by describing the product in terms of function. Claim 25 vividly illustrates the vice of a description in terms of function. 'As a description of the invention, it is insufficient, and, if allowed, would extend the monopoly beyond the invention.' "

Further, the court stated at page 372, 58 S.Ct. at page 903:

"The Circuit Court of Appeals below suggested that 'In view of the difficulty, if not impossibility, of describing adequately a number of microscopic and heterogeneous shapes of crystals, it may be that Pacz made the best disclosure possible, \* \* \*.' \* \* \* But Congress requires, for the protection of the public, that the inventor set out a definite limitation of his patent; that condition must be satisfied before the monopoly is granted."

In our case Switzer, in justification of the functional language, points out that the alternative would have been to state the critical lower limits precisely. This was done in the examples set forth in the specification. Switzer points to the fact that of the considerable number of melamine compounds encompassed by the patent, each has a different critical limit. It asserts that this renders it wholly unreasonable to expect the claims to be specific in this respect or to expect any further specificity than that which appears in the examples given.

In the General Electric case, the effect of the functional language was to broaden the claim to include *all* grains of whatever size or shape so long as they would accomplish the desired result. In our case the critical area is not enlarged in such a fashion. The critical point remains the same for each melamine compound used. It simply is not specified. But whether specified or unspecified the scope of the claim is precisely that of the invention.

[2, 3] Nor can it be said that this failure to specify the critical limit precisely results in a fatal vagueness of description. The claim must be sufficiently clear to allow others to reproduce the result at the end of the monopoly period and to enable contemporary inventors to ascertain whether or not they are infringing.

Upon this point the district court concluded:

“When the general description, the specific examples, and the claims are read together, the invention is so plainly defined that no one skilled in the art should have any difficulty in practicing it.”

The record supports this statement. There is testimony to the effect that “sufficient melamine to render the resin substantially insoluble” is a simple, clear test for an ordinary chemist to perform and one which does not require extensive experimentation in order that the precise critical limits be ascertained in a particular case. Under such circumstances, the fact that some preliminary testing is required does not render the claim invalid for vagueness. *Mineral Separation, Limited v. Hyde*, 1916, 242 U.S. 261, 37 S.Ct. 82, 61 L.Ed. 286.

[4] We conclude that the fact that the limits of melamine are, in the claims, stated in functional language does not render the patent invalid.

Radiant’s third attack upon the validity of the patent is addressed to the sufficiency of the description contained

in the specification. Radiant contends that it does not meet the requirements of 35 U.S.C. § 112 that there be "a written description" which must be in "full, clear, concise and exact terms" directed to "any person skilled in the art."

Radiant first asserts that the specification, as distinguished from the claims, does not describe the insolubility of the product. In our view, the specification when read as a whole does sufficiently describe this feature.

Radiant contends that the record establishes that one skilled in the art could not reproduce the product from the description. It appears that the district court discounted the testimony upon which Radiant relies and favored the contrary testimony of Dr. Hatcher.

Radiant protests that Dr. Hatcher was not an ordinary chemist but an expert and that his ability to reproduce was not the proper test.

[5] The ability of "any person skilled in the art" to reproduce the product was a question for the trier of fact. It was for the district court to determine whether the steps followed by Dr. Hatcher were of a type which required an expert as distinguished from an ordinary industrial chemist. We cannot say that the court's findings in this area were clearly erroneous.

We conclude that Radiant's contentions in this respect are without merit.

Radiant next contends that the Kazenas claims, as Switzer here asserts them, are invalid because they were not, in their present form, included in the original application. The feature to which this contention is specifically addressed is the resin's insolubility in aromatic solvents.

The original application was filed January 26, 1954. The claims did not then provide that the amount of melamine was required to be sufficient to render the resin

substantially insoluble in aromatic hydrocarbon solvents. Early in 1954 Switzer adopted the Kazenas resin commercially. In 1956 Switzer learned that two competitors planned to introduce competitive products and, informing the Patent Office of this fact sought to expedite issuance of patent. Following interviews in the Patent Office, the amended claims upon which the patent ultimately was issued were presented May 2, 1957. They were unaccompanied by the oath of Kazenas and, Radiant contends, were presented after the public use period had expired and intervening rights of the public had accrued. Radiant contends that under these circumstances the feature of insolubility cannot be relied upon to impart novelty.

The defense of intervening rights for which Radiant contends has developed in cases dealing with reissue and divisional patents. It is apparently aimed at protecting the public against enlargement of the original claim to encompass discoveries by others and also at achieving an equitable balance between the right of the inventor to an adequate claim of that which he has invented and the public right to reliance upon the inventor's apparent disclaimer of such invention as is not claimed.

In the area of amendment prior to patent issuance a further consideration is the public interest in an adequate disclosure by the patentee of that which is sold to the public. In *Muncie Gear Works v. Outboard etc. Company*, 1942, 315 U.S. 759, 768, 62 S.Ct. 865, 869, 86 L.Ed. 1171, it was held, "The claims in question are invalid if there was public use, or sale of the device which they are claimed to cover, more than two years before the first disclosure thereof to the Patent Office." In *Wire Tie Machine Company v. Pacific Box Corporation, Ltd.*, 9 Cir., 1939, 102 F.2d 543, this court held the rule inapplicable in a case where the amendment complained of added narrower claims and not new matter and further held that such amendment needed no supplemental oath.



[6] Here the feature of insolubility was disclosed in the specifications of the original application, although its bearing upon the critical limit in the amount of melamine was not expressed. We are not then faced with a claim of new matter nor with an attempt to rectify an inadequate disclosure or to appropriate subsequent developments or discoveries. The amendment actually amounted to no more than a narrowing of the claims to articulate a limitation implicit in the specifications but not explicit in the claims themselves. The circumstances under which the amendment was filed would indicate that it resulted from the ordinary give and take of Patent Office procedures: the shaping of the expression of that which was sought in order to make it conform appropriately to that which it was felt could properly be granted.

We conclude under these circumstances that no intervening public rights can be said to have attached to the insolubility feature of the Kazenas patent or to the matters incorporated in the claims by amendment; that no supplemental oath was required.

Finally Radiant contends that the specification of the patent is inadequate to support a claim for a broad class of melamine derivatives. It is asserted that "there is no recipe given for the proportions of the entire class of melamine compounds by which one could be certain to obtain the critical result." It is pointed out that all that Kazenas did was to give recipes for two members of the class. Radiant concludes that Kazenas thus "asked the art to experiment with other members of the class to obtain the result which he desires." Stating its proposition in somewhat different language, Radiant contends that the patent must disclose that all members of the broad melamine class are effective to produce the alleged novel result.

The cases cited by Radiant have their root in *The Incandescent Lamp Patent*, 1895, 159 U.S. 465, at page 472, 16 S.Ct. 75, at page 77, 40 L.Ed. 221, where the court stated:

“Is the complainant entitled to a monopoly of all fibrous and textile materials for incandescent conductors? If the patentees had discovered in fibrous and textile substances a quality common to them all, or to them generally, as distinguishing them from other materials, such as minerals, etc., and such quality or characteristic adapted them peculiarly to incandescent conductors, such claim might not be too broad. If, for instance, minerals or porcelains had always been used for a particular purpose, and a person should take out a patent for a similar article of wood, and woods generally were adapted to that purpose, the claim might not be too broad, though defendant used wood of a different kind from that of the patentee. But if woods generally were not adapted to the purpose, and yet the patentee had discovered a wood possessing certain qualities, which gave it a peculiar fitness for such purpose, it would not constitute an infringement for another to discover and use a different kind of wood, which was found to contain similar or superior qualities. The present case is an apt illustration of this principle. Sawyer and Man supposed they had discovered in carbonized paper the best material for an incandescent conductor. Instead of confining themselves to carbonized paper, as they might properly have done, and in fact did in their third claim, they made a broad claim for every fibrous or textile material, when in fact an examination of over six thousand vegetable growths showed that none of them possessed the peculiar qualities that fitted them for that purpose. Was everybody, then, precluded by this broad claim from making further investigation? We think not.”

[7] In the instant case there is nothing in the record to suggest that the qualities discovered by Kazenas were not



common to melamine and to such of its derivatives as were specified in the claims, the only difference being in the critical limit in the amount of the component used. As we have already pointed out, there is evidence that the ascertainment of these specific limits in any particular case did not require extensive or undue experimentation. With respect to Radiant's contention that Switzer must establish the effectiveness of each member of the broad class, the district court stated:

"Plaintiffs have cited no authority and the court is aware of none that places such a burden on the defender of a patent."

We agree.

In our judgment this contention is without merit.

[8] We conclude that in all aspects challenged by Radiant, the Kazenas patent is valid.

Radiant next contends that it has not infringed the Kazenas patent. In this respect it looks not to the claims (which we have already held to be valid) but to the examples set forth in the specifications. It asserts that it uses more melamine (27.6% or 36.9%) than was used in the examples (13%); that it uses too little formaldehyde; that its process is different from that shown in the examples.

The amounts of melamine used by Radiant are well within the upper limit (50%) set by the claims. While the claims do not specify the amount of aldehyde, it is clear that it is such an amount as will permit complete co-condensation.

Radiant asserts that its proportions are closer to those of the Japanese patent than to those of the Kazenas patent and that it should accordingly be regarded as protected by prior art. Radiant concedes, however, that the Japanese patent is not adequate to meet its needs.

What it requires is that which the Kazenas resin provides: completeness of co-condensation and insolubility in aromatic solvents.

In our judgment then, the district court was not in error in concluding that Radiant's resins infringed the Kazenas patent.

[9] In several respects in post-trial proceedings (the settlement of findings, motions for new trial and to vacate judgment) Radiant attempted to introduce new matters of evidence. It offered proof of other patents to establish lack of invention. It offered testimony of Kazenas in another unrelated proceeding assertedly inconsistent with Switzer's position in the instant case. It offered testimony relating to post-decision tests run by it. It invited a second look at physical evidence which had been offered at trial to demonstrate the free flowing and insoluble character of the Kazenas resin, asserting that such second look would demonstrate that since trial the resin had agglomerated.

[10] All of this evidence was rejected by the district court for failure of Radiant to show diligence or justification for its failure to discover and present these matters at the time of trial. Radiant assigns error in this respect but we find no abuse of discretion in this ruling. The time for testing of proof is the time of trial. Our judicial system does not contemplate that the rights of litigants shall be held in abeyance for months or years in order that hindsight may provide a more accurate appraisal of evidence.

Radiant protests that the post-trial change in physical evidence should not be subject to the requirement of diligence. If the fact was that the resin would agglomerate and would not remain free flowing, Radiant could have established this by its own pre-trial experiments and have introduced evidence with respect to those experiments at the proper time. Post-trial experimenting with the evi-

dence produced at trial is no substitute for the proper and orderly presentation of proof. Furthermore, there is no evidence as to the conditions to which this exhibit had been subjected following trial and thus a proper foundation was not laid for the admissibility of this offered proof.

Radiant protests that a showing of diligence is not necessary where the proof offered shows a lack of clean hands on the part of the patentee; that it had offered proof of deception practiced by Kazenas and Switzer both on the Patent Office and on the district court. It contends that in the public interest, where the question of deception or unclean hands is at issue, the question can be raised at any time. *Hazel-Atlas Glass Company v. Hartford-Empire Company*, 1944, 322 U.S. 238, at page 246, 64 S.Ct. 997, at page 1001, 88 L.Ed. 1250, is cited where the court states:

“This matter does not concern only private parties. There are issues of great moment to the public in a patent suit. \* \* \* Furthermore, tampering with the administration of justice in the manner indisputably shown here involves far more than an injury to a single litigant. It is a wrong against the institutions set up to protect and safeguard the public, institutions in which fraud cannot complacently be tolerated consistently with the good order of society. Surely it cannot be that preservation of the integrity of the judicial process must always wait upon the diligence of litigants. The public welfare demands that the agencies of public justice be not so impotent that they must always be mute and helpless victims of deception and fraud.”

However, it should be obvious that every disgruntled litigant cannot, in the name of public welfare, secure a new trial simply by charging fraud. In *Hazel-Atlas* the Supreme Court recognized this, stating in 322 U.S. at page 248, 64 S.Ct. at page 1002:

“The petition must contain the necessary averments, supported by affidavits or other acceptable evidence; and the \* \* \* court may in the exercise of a proper discretion reject the petition \* \* \*.”

In Hazel-Atlas the proof of fraud was clear. Not so in the instant case. Here the district court, after listening at great length to the contentions of Radiant’s counsel respecting its proof of deception, stated:

“\* \* \* I don’t see any aspect of fraud or misrepresentation or chicanery involved in the application for the patent in this case \* \* \*.”

and later:

“I abhor fraud and misrepresentation and I never have any hesitancy in turning aside any decision or in granting relief in cases of that kind. But I don’t discern in this case anything of that sort.”

[11] We have examined the matters charged by Radiant and the offered proofs and concur in the views of the district court. It was not then an abuse of discretion for the district court (bearing in mind both lack of diligence and the showing made with respect to fraud and the public welfare) to deny a new trial upon the ground of unclean hands or to refuse to delay judgment in order that hearing might be had on the newly tendered issues.

Affirmed.

### Appendix C

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Abstract of testimony of Dr. David B. Hatcher taken in open court on January 15 and 16, 1959 and abstracted from pages 362-479 of the printed transcript of record on appeal No. 16,780.

Q. Are you familiar with the Kazenas patent in suit?

A. Yes, I am.

Q. Are you familiar with the resins described therein?

A. Yes, I am.

Q. Are these resins co-condensation products?

A. I would call them such.

Q. Based on your observations of industrial thermoplastic and thermosetting resins, what, if anything, is unusual about the Kazenas resins?

A. Kazenas resin is unusual in that I know of no other thermoplastic resin containing substantial amounts of melamine. Normally, melamine-containing resins are thermoset.

In addition to that, it is insoluble in toluene, while being soluble in acetone; and, being soluble in acetone, it exhibits no separation, indicating that it is a single resin, not a mixture of resins.

Q. What, if anything, is unusual about a resin being thermoplastic and yet insoluble in toluene?

The Court: And yet what?

Mr. Manahan: And yet insoluble in toluene.

A. (By the Witness): The common thermoplastic resins are all either swelled or dissolved by aromatic solvents. I should say swelled or softened or dissolved.

Q. (By Mr. Manahan): And toluene is an aromatic solvent?

A. Yes, it is one of the common aromatic solvents.

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Q. (By Mr. Manahan): How does Kazenas teach that no unreacting ingredients are present in its resin?

A. By teaching that it's insoluble in toluene.

The Court: I am sorry, I didn't hear your answer.

The Witness: I say that it is insoluble in toluene.

The Court: I still didn't get it.

The Witness: Insoluble in toluene.

The Court: Insoluble.

The Witness: Or, rather, I should say in aromatic solvents.

\* \* \* \* \*

Q. What does the Kazenas patent teach you about the melamine content with relation to insolubility in toluene or an aromatic solvent?

A. It says that there must be sufficient melamine content to cause insolubility in aromatic solvents.

\* \* \* \* \*

Q. (By Mr. Manahan): What, if anything, is critical about the solubility of a resin used as a pigment?

A. It is necessary that it be sufficiently insoluble that it will not agglomerate in the vehicle that is used.

Q. How difficult is the solubility test for a resin?

A. It is not difficult. It is readily observable.

\* \* \* \* \*

Q. (By Mr. Manahan): Dr. Hatcher, are you familiar with Japanese Patent, the translation of which is Plaintiffs' Exhibit 13? A. Yes, I am.

Q. What melamine proportion does this patent disclose? A. It shows a melamine proportion of 5%.

Q. Five percent of what?

A. At 5% of the sulfonamide resin.

Q. What formaldehyde proportion does this disclose?

A. It shows a molecular ratio of one mole of formaldehyde to each mole of sulfonamide resin.



Q. Have you ever carried out the procedure of the Jap patent that is Plaintiffs' Exhibit 13?

A. It has been carried out under my direct supervision in my presence.

Q. Have you an example of the result that you obtained? A. Yes, I have.

Q. Give us the exhibit number, will you, please?

A. It is Exhibit O.

Q. Do you recall the softening point of this resin?

A. As I recall, the softening point was approximately 89 degrees Centigrade.

Mr. Hoppe: May it please the Court, I would like to have the record show that this experiment, like our experiments, was conducted Ex Parte. It was conducted without notice to us, which is contrarywise to the objection made to our testimony, and that we were not invited to be present.

I do not object to it. I just want to show that these tests were made under the same circumstances as our tests were.

The Court: What is sauce for the goose is sauce for the gander.

Mr. Hoppe: Yes.

The Court: Go ahead.

Q. (By Mr. Manahan): Did you follow exactly the procedure set forth in the Japanese Patent?

A. The procedure in the Japanese Patent was followed explicitly.

Q. What was the solubility of the resulting resin?

A. It was soluble in toluene.

\* \* \* \* \*

Q. Have you ever carried out the procedure of the Kazenas Patent, Example 5? A. Yes, I have.

Q. Do you have an example of the resin obtained?

A. Yes, I have. It is Exhibit N—N as in Nelly, your Honor.

Q. What is the softening point of that resin?

A. As I recall, it was 112 degrees Centigrade.

Q. What was the solubility of this resin in toluene?

A. It was insoluble in toluene.

Q. How can you tell?

A. By dispersing it in toluene and leaving it. It did not agglomerate. It remained free-flowing.

Q. When was this resin prepared?

A. It was prepared in late August, 1958.

Q. Have you had that sample under your watch and care ever since?

A. I have had it in my possession since that time.

Q. Is the resin still insoluble?

A. The resin still is insoluble. It is free-flowing.

\* \* \* \* \*

Q. Would you expect that the softening point of a resin such as the Kazenas resin would change as much as 20 to 30 degrees Centigrade over a period of nine months?

A. No, I would not expect that.

Q. Can you offer any logical explanation for it?

A. No, I cannot.

Q. Would you expect solubilities to change in this period of time in the same type of resin?

A. No, I would not.

Mr. Manahan: That is all, your Honor. Cross-examine.

\* \* \* \* \*

Q. Now, is Example 2 of the Kazenas Patent substantially insoluble in aromatic hydrocarbon solvents?

A. I have not checked that personally.

\* \* \* \* \*

Q. In the Japanese resin, I think that we are in agreement that that is not substantially insoluble in aromatic hydrocarbon solvent? A. That is correct.

Q. And it is your position that Example 5 of the Kazenas resin is essentially insoluble in hydrocarbon solvents? A. Yes, it is.

Q. At what point between 5% of the Japanese Patent and 13% of the Kazenas Example 5 does one note a change from insolubility—I mean from solubility to insolubility?

A. I do not have that information. I know that at 5% it is soluble, at 13% it is insoluble.

Q. Have you made any tests to determine what would happen if you would increase the percentage of melamine in the Japanese example by gradual increment to the percentage of melamine in Example 5 of Kazenas?

A. No, I have not.

Q. As a man skilled in the art, if we were to increase the percentage in the Japanese example from 5% to 7%, would there be a decrease in solubility in aromatic hydrocarbon solvents?

A. I cannot say definitely; I can only speculate. At some point there would come the point at which the raw material would be free-flow. I do not know at what point that would be between 5 and 13%.

Q. Now, Dr. Hatcher, in your examination—my notes may not be accurate, so I may be misstating what you say—but I believe that you testified that you saw in the Kazenas Patent a teaching that resin examples 1 to 6 were practically insoluble in aromatic hydrocarbon solvents.

Before asking the question I want to ask you if I correctly stated your contention?

Mr. Sherman: Where do you find that?

Mr. Hoppe: My notes may be inaccurate. That is why I am asking if I correctly stated his contention.

The Witness: Would you repeat that, please?

Mr. Hoppe: Would you repeat that to the witness, Mr. Reporter? (Record read.)

A. Yes, I believe there is a teaching there that those materials are insoluble in aromatic hydrocarbon solvents.

Q. (By Mr. Hoppe): Would you please refer to the language to which you have reference by chapter and verse? A. I find on page—rather, column 7—

Q. Column 7?

A. Line 21 after the capital A. “\* \* \* sufficient to render said completely condensed, thermoplastic resin substantially insoluble in aromatic hydrocarbon solvents but insufficient to render it thermosetting.”

Q. All right. Do you find that language any other place or language to that effect any other place in the specification? A. I have not looked specifically for it.

Q. I wish you would, because this will become rather important.

A. I find in column 6, line 4: “The pigments prepared in the manner described in the foregoing examples”—this refers to Example 13. Pardon me. I read again: “The pigments prepared in the manner described in the foregoing examples are insoluble in water and aliphatic hydrocarbon solvents, are practically insoluble in aromatic hydrocarbon solvents, \* \* \*”

Q. And it continues: “are soluble in ketones and solvent esters.” A. That is correct.

\* \* \* \* \*

Q. Now, let's refer to Example 2. Do you find any teaching any place in the patent outside of the language you refer to in the claims that that resin is substantially insoluble in aromatic hydrocarbon solvents?

A. In general I believe this is another example that ties in with the remainder of the patent. Consequently I have not studied it from the standpoint of whether each example has a complete description of what the material is other than that they do all have somewhat the same properties. They all fit within the bounds of the patent.

Q. I would like it, if you will during the next recess, could examine the specification and see if you can find any language other than the language contained in the claims

and the language referring to the pigments which you read to us which refer in any way specifically to solubility in aromatic hydrocarbon solvents.

\* \* \* \* \*

Q. Where do you find in the Kazenas patent a teaching that the solubility in aromatic hydrocarbon solvents is keyed to the quantity of melamine?

A. In reading the entire patent it gives that impression, that enough melamine is required to achieve that result.

Q. Would you please read one sentence that gives that expression?

A. I did in just reading the first column, starting about Line 30, it is speaking of the thermoplastic resin, and it says down about Line 43, "On the other hand, the new resin, unlike the melamine-aldehyde resins, is soluble in certain solvents and is thermoplastic."

No, that isn't the one I was searching for.

Q. Do you find any language in there referring to insolubility in aromatic hydrocarbon solvents?

A. Not there. In the patent I do. I find it in a number of places.

Q. Well, let's find one.

A. Let's take Column 1, Line 57:

"The new resin is insoluble in many common vehicles and can therefore be suspended in such vehicles without coalescence or agglomeration."

The common vehicles are, normally, of an aromatic nature.

Q. Are not aliphatic hydrocarbon solvents used in coatings?

A. They are used to the extent that it is possible to use them, but, in general, it is necessary to have aromatic solvents in order to get sufficient solubility. They are normally used in coating resins.

Q. Are ketones not used as solvents in the paint field?

A. They are used in some, but they are much less common. They are not a common solvent.

Q. And are solvent esters not used in the paint field?

A. Yes. They are not as common as the aromatic solvents, though.

Q. Can you read in the claim that many common solvents, the relationship between the minimum quantity of melamine and insolubility in aromatic hydrocarbon solvents?

A. I would put that construction on it in view of other passages in the patent referring to that more specifically.

\* \* \* \*

Q. (By Mr. Hoppe): Now, Dr. Hatcher, another well-known quality of a sulfonamide-aldehyde resin is that it is soluble in aromatic hydrocarbon solvents, is that not correct?

A. Sulfonamide-aldehyde resins are soluble.

Q. It was a well-known quality of melamine-aldehyde resins that they were insoluble in aromatic hydrocarbon solvents? A. That is correct.

Q. And I suppose if I would ask you as to the problem it would be to find the point at where you would change from the qualities of one to the other in an intermixture, we would again be confronted with this industrial problem which you pointed out?

A. The problem is in choosing the problem. Once the problem is chosen, if you apply enough manpower and enough money to it, you can investigate it. But the real problem is in choosing the area of activity.

\* \* \* \*

Q. Now, Dr. Hatcher, I would like to pose a hypothetical question to you. I would like to propose that you take an alkyl methylol melamine and substitute it for the melamine of any one of Examples 1, 2, 3, 4, 5 and 6, and



you select whichever one you want, whichever example you want, and whichever form of alkyl methylol melamine you desire, and state what percentage of alkyl methylol melamine would be required in any one of those examples where you make the substitution to obtain a completely condensed thermoplastic resin substantially insoluble in aromatic hydrocarbon solvents, but insufficient to render it thermosetting.

A. That was such a long question that I can't follow all of it. May I have it read back?

Q. Will you read the question, please?

(Record read by the reporter.)

A. My assumption, I would use monomethyl melamine substitute in Example 5 in the same approximate percentage as Example 5. There would not be a substantial difference. What would result would be that the exact proportions of formaldehyde to active amide groups would be somewhat higher; however, that would not be disadvantageous.

Q. Would you use the same temperatures as those given in Example 5?

A. Yes, I would.

Q. And when you finished with your experiment, would the product be completely condensed?

A. That would be my assumption, yes.

Q. Could you predict that it would be completely condensed with accuracy? A. I believe so.

Q. Would the product be thermoplastic?

A. My best guess is that it would be.

Q. Can you predict that accurately?

A. Not with 100% accuracy, no.

Q. Would the product be substantially insoluble in aromatic hydrocarbon solvents?

A. I would think from reading the patent that it would be.

Q. Can you predict that it would be?

A. I would predict that it would be.

Q. Now, let us substitute for the alkyl methylol melamine example that you selected for Example 5 one containing a butyl group as the alkyl group. Would you then use the same weight proportions as those given in Example 5?

A. I probably wouldn't. I would probably increase the percentage of the alkyl melamine somewhat.

Q. How would it increase it? Why?

A. Because you're cutting down the—as you increase the size of the alkyl group, you increase the molecular weight of the melamine and, if you increase the molecular weight of the melamine, you are putting less reactive melamine in than you were previously.

Now, in the case of the methyl melamine, I said we could substitute on an equal basis because the molecular weights are not substantially different. When you start getting a butyl group, then you're increasing the molecular weight of that substituted melamine to the point where you are throwing the proportion of melamine and the sulfonamide completely off. I am speaking of the molar proportions.

Q. So you would use, instead of the definitions of grams of the materials given in Example 5—you would convert them to molar proportions and you would endeavor to have as many of the melamine nuclei in your modified Example 5 that there appear in Example 5 of the Kazenas patent; is that right? A. Approximately.

Q. And when you would do that, would you be certain that the product would be insoluble in aromatic hydrocarbon solvents?

A. In organic chemistry you are never certain of an experiment that you haven't previously run.

Q. Would you be certain that the product was not thermosetting?

A. I would not be certain. I would be willing to predict that it would not be thermosetting; however, there is never any certainty.

Q. Now, referring to a change of the sulfonamide in example 5, what change would you make if you were to substitute benzine sulfonamide for the mixture of O and P toluene sulfonamide?

A. I would increase the amount of formaldehyde slightly in order to have——

Q. Is that the only change which you would make?

A. I might adjust the amount of melamine up slightly to get the same molar ratios.

Q. What would you do if you were to substitute an alkyl derivative of benzine sulfonamide in which the sulfonamido group is attached directly to the aromatic nucleus to the sulphur atoms?

A. You are speaking, for instance, of ethyl benzine?

Q. Let's take that for example.

A. I would probably use the same proportions in the example.

Q. Would you be certain beforehand that you would have a thermoplastic resin?

A. I will answer that as I did previously, that I would be willing to predict so, but without having actually run it myself, I would not be absolutely certain.

Q. Now, let's assume that we take a different alkyl, an alkeate such as the Hexal group, what would you then do?

A. I presume you are referring to alkyl?

Q. Alkyl.

A. In that case I would probably adjust the proportions slightly to arrive at approximately the same molar ratio, the same proportions on a molar basis.

Q. Now, in making your prediction, if you found out that the product was thermoplastic but that it was soluble in aromatic hydrocarbon solvents, what change would you make in the example to make it substantially insoluble?

A. This is getting extremely hypothetical. First of all, we will assume that it would be aromatic hydrocarbon soluble and not you are asking what we would do to change it, if we wanted——

Q. Yes, sir.

A. I don't find anything—I shouldn't say I don't find——

The Reporter: Will you raise your voice, please, Doctor?

A. Certainly. In reading the patent, I haven't come upon any directions on how you would adjust every minor instance that might happen.

Q. Would a man skilled in the art as of January 26, 1954,—and we are again speaking to this hypothetical man skilled in the art to which we referred at the close of court yesterday—would he know what to do without referring to the patent directions?

A. If he found that it was aromatic hydrocarbon soluble and you supposedly in this hypothetical situation had this resin of Kazenas——

Q. It is thermoplastic and it still is soluble; would he have been able to alter the ingredients in this hypothetical example as of January 26, 1954, to meet the requirement of the claim?

A. You mean he had complete knowledge of the entire Kazenas patent?

Q. He has no knowledge of the Kazenas patent.

A. In that case I would think it would be very difficult to predict.

Q. Dr. Hatcher, I hand you Defendant's exhibits L, M, N and O, which I believe were made under your direction.

A. That is correct.

Q. Who made them? A. Mr. Gray.

Q. Thomas Gray who is sitting at counsel table here?

A. That's correct.

Q. When did he make them?

A. As I recall, it was August 27th and 28th of 1958.

Q. And where did he make them?

A. At the Switzer Brothers laboratory.

Q. Where were you when he made them?

A. I was standing right beside him all the time.

Q. Were you watching everything that he did?

A. I watched very carefully.

Q. Did you make notes of what he did?

A. He did not make notes at that time, but notes were made.

Q. Who made the notes?

A. Mr. Manahan made the notes.

Q. Was Mr. Manahan there at that time?

A. Yes, he was, and I checked to make sure that the notes were properly made.

Q. Do you know who has those notes now?

A. No, I do not.

Q. After the samples were completed—How long did it take to complete them first? A. Two days.

Q. And were you there during the entire two-day period? A. Yes, I was.

\* \* \* \* \*

Q. After these Examples, L, M, N and O were made—First, were they all made the same day?

A. No, they were made one day and—Well, I will have to check that. I believe that—I can't state which were made which days. They were both made during that two-day period.

Q. And after the resins were completed, did you test the Japanese resin to see if it was friable?

A. Yes, we did.

Q. Was it friable? A. Yes, it was friable.

Q. Did you save any of the resin of those examples?

A. The only one—well, all that I have are these examples in toluene. I do not have the resins themselves.

Q. And after you made the resins, would you state what you did with these specific resins to make those examples that you have there?

A. Yes. We ground each one of them in a mortar and pestle and we put 10 grams of the resin with 40 grams of toluene into each of these bottles and shook them up to determine the solubility. We also ran melting point tests.

\* \* \* \*

Q. Now, after you put the material in these bottles, what did you then do with the bottles?

A. I put them in a box and took them with me.

Q. Back to Chicago? A. That's right.

Q. And they have been in your custody ever since?

A. They have.

Mr. Hoppe: No further cross-examination.

\* \* \* \*

Q. Dr. Hatcher, you were also asked if you would examine the Kazenas patent and find any statements relating to—Oh, strike that question.

You were asked to examine the Kazenas patent and find any statements which would lead you to believe that the melamine content of the Kazenas resin was such that it was insoluble in aromatic hydrocarbon solvents, and you did examine the patent during the recess but you were not asked the question again on cross-examination. I will ask it to you now.

A. Yes, I find four references to it.

Q. Could you read those, please?

A. On Column 1, line 57, it says:

“The new resin is brittle and friable below its softening point”—No, that's not it. “The new resin is insoluble in



many common vehicles and can therefore be suspended in such vehicles without coalescence or agglomeration."

Then going to Column 5, the portion that we just read where it says, "If desired, the undyed resin may be prepared as in Examples 1 to 6 and dyed by immersion in an aqueous dye bath," which refers on to Column 6 where it says at line 4:

"The pigments prepared in the manner described in the foregoing examples are insoluble in water and aliphatic hydrocarbon solvents, are practically insoluble in aromatic hydrocarbon solvents, and are soluble in Ketones and solvent esters."

Then in that same column, line 21,

"Based on these physical characteristics, the pigments may be used in vehicles which are non-solvents for the pigments to form various types of inks and the like."

These would lead to the very strong conclusion that they are unsoluble in aromatic solvents.

Q. Is it the melamine that imparts the insolubility to the Kazenas resin, combined in the resin body?

A. When combined in, yes, I would say that it very probably is. I know of nothing else in there which could cause that.

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#### Recross Examination

Q. (By Mr. Hoppe): Dr. Hatcher, to a man skilled in the art, is there any difference between being soluble in common vehicles and the usual solvents? This is without reference to the patent. I am just asking you about the words "common vehicles" and "usual solvents."

A. There could be some difference, slight difference. Here I am sure it is meant in that manner, however.

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Q. Now, turning to the language which you find concerning the insolubility in aromatic hydrocarbon solvents,

with reference to the word "pigments," appearing in line 4, all of the——

A. (Interposing.) Of what column?

Q. Line 4 of Column 6. A. Column 6?

Q. Yes; all of the pigments have a dyestuff in them, do they not, whether they are made according to Examples 7 to 13, as originally stated, or as Example 12 with the last sentence added?

A. Would you state the numbers of the Examples?

Q. 7 to 13, as originally stated, plus the added paragraph under Example 12. A. Yes.

Q. Now, the pigments prepared in the manner prescribed in the foregoing examples, therefore, all have the following ingredients: a melamine, a sulfonamide, an aldehyde, and a dyestuff, is that correct?

A. No, that is not correct. Those examples have a resin of the Kazenas type and a dyestuff, and the resin does not contain a melamine, a sulfonamide and formaldehyde, it is reacted resin resulting from a reaction of those materials.

Q. Now, taking your answer, is there anything that you read in the words that you read to the Court which defines which of those four ingredients contributes to the insolubility in aromatic hydrocarbon solvents?

A. No, there is nothing that I can see that says which one contributes to insolubility.

Q. Referring to your language that you found: the new resin is insoluble in many common vehicles and can therefore be suspended in such vehicles without coalescence or agglomeration, is there anything that you see in that sentence which tells you which of the ingredients is responsible for the lack of solubility in aromatic hydrocarbon solvents?

A. No, and often it's a new combination that gives you the different properties, rather than just the fact that

you put the two things together and mix them. When you mix them, you react them and get a property that isn't the property of either one of the original ingredients.

Q. Now, do you find anything in the patent which states what it is that contributes to the insolubility in aromatic hydrocarbon solvents?

A. . . . Yes, it does say sufficient to render said completely condensed thermoplastic resin substantially insoluble. I will have to correct my testimony.

Q. That is the language keys it to the amount of melamine? A. Yes, that's right.

Q. That is the only language which keys it to the amount of melamine, is it not?

A. With regard to softening point on Page 3, it says: If too small a quantity of melamine is used, the softening point of the product will differ only slightly from the softening point of the sulfonamide formaldehyde resin.

Q. Now, that is the only language you find in the specification that relates to the lower quantity of melamine, isn't it, other than that which you read in the claims? A. That is all I find at this time, yes.

Mr. Hoppe: That's all.

#### Redirect Examination

Q. (By Mr. Manahan): As a chemist, Dr. Hatcher, do you recognize from the Kazenas patent that the combination of a melamine component into the resin will impart toluene insolubility into the resin?

A. Yes. As I testified previously, there is nothing else there that could do it. It has to be the melamine that does it.

Mr. Sherman: That's all, Dr. Hatcher.

Mr. Hoppe: That's all.

## Appendix D

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Opinion of the Court of Appeals for the Ninth Circuit  
filed June 30, 1965, as reported in 348 F.2d 244.

Harry P. LOCKLIN and Elmer J. Brant, General partners doing business  
under the firm name of Radiant Color Company, Plaintiffs-Appel-  
lants,

v.

SWITZER BROTHERS, INC., a corporation, Defendant-Appellee.

No. 19467.

United States Court of Appeals  
Ninth Circuit.

June 30, 1965.

The plaintiffs were found guilty of civil contempt for violation of an injunction against infringement of defendant's patent, and they appealed from the order of the United States District Court for the Northern District of California, Southern Division, William T. Sweigert, J. The Court of Appeals, Merrill, Circuit Judge, held that plaintiffs were entitled to trial on issue as to whether the accused formula fell within narrow limits of patent, notwithstanding that issue had not been clearly directed to district court's attention, where plaintiffs had been encouraged to submit to inappropriate summary proceedings which may well have contributed to result that issues not overly apparent in absence of cross-examination were not thoroughly explored and presented at time of argument.

Order affirmed in part and the matter remanded with instructions.

### 1. Affidavits (Key) 18

Receipt of proof in form of affidavits was error where factual determinations were required on critical issues raised in civil contempt case for violation of injunction

against infringement of patent. Fed.Rules Civ.Proc. rule 43(a, e), 28 U.S.C.A.

**2. Patents (Key) 326(4)**

The erroneous receipt of proof in form of affidavits in civil contempt case for violation of injunction against infringement of patent was invited if not waived, where plaintiffs expressed view that witnesses should be brought before court but did not object to decision that the matter should proceed initially by affidavits and that if they disclosed genuine conflicts in contentions of fact or opinion that question of calling of witnesses might then be renewed, and plaintiffs, at time of hearing, did not renew their contention that issues disclosed by affidavits would justify the calling of witnesses. Fed.Rules Civ.Proc. rule 43(a, e), 28 U.S.C.A.

**3. Patents (Key) 326(4)**

In civil contempt case for violation of injunction against infringement of patent, plaintiffs were entitled to trial on issue as to whether accused formula fell within narrow limits of patent, notwithstanding that issue had not been clearly directed to district court's attention, where plaintiffs had been encouraged to submit to inappropriate summary proceedings which may well have contributed to result that issues not overly apparent in absence of cross-examination were not thoroughly explored and presented at time of argument.

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Carl Hoppe, Ernest M. Anderson, San Francisco, Cal., for appellants.

Harold C. Hohbach, Flehr & Swain, San Francisco, Cal., Benjamin H. Sherman, Hill, Sherman, Meroni, Gross & Simpson, Chicago, Ill., for appellee.

Before BARNES, JERTBERG and MERRILL, Circuit Judges.

MERRILL, Circuit Judge:

This appeal is taken from an order adjudging appellants guilty of civil contempt for violation of an injunction against infringement of appellee's patent. The injunction was issued pursuant to mandate of this court following our decision holding appellee's patent valid and infringed, *Locklin v. Switzer Bros., Inc.*, 299 F.2d 160 (9 Cir. 1961), cert. denied, 369 U.S. 861, 82 S.Ct. 950, 8 L.Ed.2d 18 (1962).

The patent there in issue, the Kazenas patent,<sup>1</sup> was for a resin which was a co-condensation of a melamine, a sulfonamide and an aldehyde, and which possessed characteristics of substantial importance in the manufacture of pigments for use in fluorescent paint. Following our earlier decision and the injunction against infringement, appellants produced and utilized a resin designated as "4-C," which utilized the three ingredients of the Kazenas formula with the addition of a relatively small amount of urea. Appellee then initiated these proceedings contending that production of the 4-C resin constituted a violation of the court's injunction. The District Court agreed.

Appellants make two contentions upon this appeal.

[1, 2] The first relates to the procedures followed by the District Court. The court treated the matter as one on motion under Rule 43(c) F.R.Civ.P. rather than as a trial for infringement under Rule 43(a). Accordingly proof was received in the form of affidavits. Appellants now assert that this was error, since factual determinations were

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<sup>1</sup>Letters patent No. 2,809,954, assigned to Switzer.



required upon critical issues. We agree.<sup>2</sup> The error, however, would appear to have been invited if not waived.

At the outset of the proceedings appellants expressed the view that the matter could not adequately be tried on affidavits and that "on a matter of such seriousness as this we should bring our witnesses before the court." It was ultimately decided, however, without objection by appellants, that the matter should proceed initially by affidavit; that if an analysis of the affidavits disclosed genuine conflicts in contentions of fact or opinion the question of the calling of witnesses might then be renewed. The record does not disclose that appellants, at the time of hearing, renewed their contention that issues disclosed by the affidavits would justify the calling of witnesses. No offer of oral testimony was made.

[3] Upon the merits of the dispute appellants contend that their accused formula 4-C does not fall within the narrow limits of the Kazenas patent as delineated in our earlier opinion. Notwithstanding the fact that the amount of urea used by them is relatively small, still, they assert, the urea is used in place of melamine, and reduces the amount of melamine which is utilized to a point where the melamine alone is not sufficient to render the product substantially insoluble in aromatic hydrocarbon solvents.

Appellee asserts that this is not the proper test and that the claims of the Kazenas patent should not be so limited. It points out that the amount of melamine utilized by appellants is well within the spread fixed by the

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<sup>2</sup>That trial under Rule 43(a) is the appropriate method of resolving issues raised by opinion testimony in patent cases is suggested in Moore's Federal Practice, § 43.03, where it is stated in comment upon this rule:

"It follows, therefore, that the practice under Equity Rule 48, in patent and trade-mark actions, of setting forth in affidavits the testimony in chief of expert witnesses whose testimony is directed to matters of opinion, is no longer proper."

minimum and maximum limits set forth in the Kazenas claims and within the area covered by the examples given. It contends, as was argued to the District Court, that the true issues are whether the 4-C resin is equivalent to the infringing resin to which the injunction was directed, and whether the urea was essential to produce the desired characteristics of 4-C.

We cannot agree. In our judgment if appellants' contentions are factually correct there would be no infringement. In our earlier opinion we ruled that the use of this functional language in specifying the amount of melamine required (an amount sufficient to render the condensation product substantially insoluble in aromatic hydrocarbon solvents, but insufficient to render it thermo-setting) did not invalidate the claims, but by the same token it served to fix precisely the limits of the claims.

Upon the specific issue here raised by appellants the District Court has made no findings. It does not appear, however, that this precise issue was clearly directed to the court's attention.

We are thus hard put to find reversible error upon the record as to either of appellants' contentions.

We do feel, however, that in all fairness appellants are entitled to trial upon this issue. While the District Court acted with commendable concern for the conservation of trial time, the result was to encourage counsel to submit to summary proceedings, which, as a matter of hindsight, would now appear to have been inappropriate. The summary character of the proceedings, in turn, may well have contributed to the result that issues not overly apparent in the absence of cross-examination were not thoroughly explored and presented at the time of argument.

The record does not, however, suggest that trial upon any other issue is similarly justified under the circumstances. In all other respects the order of the District Court is entitled to affirmance.

Accordingly the matter is remanded with instructions that the order of the District Court be set aside and that trial be had upon the sole question whether, in the 4-C resin, the amount of melamine utilized is such as to bring the resin within the limits of the claims of the Kazenas patent as those claims are delineated in our former opinion.

## Appendix E

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### Memorandum of Decision of the District Court filed February 17, 1966.

In the United States District Court for the  
Northern District of California,  
Southern Division

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No. 36995

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Harry P. Locklin and Ehner J. Brant, general partners doing business under firm name of Radiant Color Company, Plaintiffs,	}
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vs.

Switzer Brothers, Inc., a corporation, Defendant.	}
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## MEMORANDUM OF DECISION

SWEIGERT, J.

This case is before the Court on a petition filed by defendant Switzer Brothers, Inc., (hereinafter referred to as Switzer) on May 8, 1963, for an order adjudicating plaintiffs, doing business as Radiant Color Company (hereinafter referred to as Radiant), in civil contempt for violation of the judgment of this Court, entered on November 17, 1959.

That judgment held that claims 1, 2, 3, 4 and 9 of Switzer's Kazenas patent were valid and were infringed by certain fluorescent pigments manufactured by Radiant.

On appeal, the judgment was affirmed, *Locklin v. Switzer Bros., Inc.*, 299 F.2d 160 (9th Cir. 1961).

On May 2, 1962, an injunction was entered permanently enjoining Radiant from making, using, selling or offering for sale, except under license from Switzer any fluorescent pigment embodying or manufactured by the use of the inventions disclosed in the above claims of the Kazenas patent.

On March 31, 1964, this Court found Radiant guilty of civil contempt for violation of the injunction. Upon appeal, the Court in *Locklin v. Switzer Bros., Inc.*, 348 F.2d 244 (9th Cir. 1965) remanded the case for a determination of the specific question whether, in Radiant's accused 4-C resin, the amount of melamine utilized is such as to bring the resin within the limits of the claims of Switzer's Kazenas patent, No. 2,809,954, as those claims were delineated in the Court's prior opinion in 1961.

Pursuant to the remand, this Court held an evidentiary hearing on the above question from October 11, 1965, to October 15, 1965.

Radiant contends that its accused formula 4-C resin does not fall within the following functional language of claim 2 of the Kazenas patent:

“[T]he amount of said melamine compound being an amount . . . sufficient to render said condensation product substantially insoluble in aromatic hydrocarbon solvents. . . .”

Specifically, Radiant contends that, notwithstanding the fact that the amount of urea used by them in the 4-C resin is relatively small, the urea is used in place of melamine, and reduces the amount of melamine to a point where the melamine alone is not “sufficient to render said condensation product substantially insoluble in aromatic hydrocarbon solvents.”

The 1965 Court of Appeals decision held that, if Radiant's contention is factually correct, there would be no infringement, stating with regard to the above language of claim 2 of the Kazenas patent:

"In our earlier opinion we ruled that the use of this functional language in specifying the amount of melamine required . . . did not invalidate the claims, but by the same token it served to fix precisely the limits of the claims." *Locklin v. Switzer Bros., Inc.*, supra at 246.

In its earlier opinion the Court had found that the language was not vague, stating:

"There is testimony to the effect that 'sufficient melamine to render the resin substantially insoluble' is a simple, clear test for an ordinary chemist to perform and one which does not require extensive experimentation in order that the precise critical limits be ascertained in a particular case. Under such circumstances, the fact that some preliminary testing is required does not render the claim invalid for vagueness." *Locklin v. Switzer Bros., Inc.*, supra at 166.

The Court had also pointed out the reason why the lower limit of the amount of melamine, which would render the resin substantially insoluble, could not be stated in precise quantitative terms, stating:

"Switzer points to the fact that of the considerable number of melamine compounds encompassed by the patent, each has a different critical limit. It asserts that this renders it wholly unreasonable to expect the claims to be specific in this respect or to expect any further specificity than that which appears in the examples given." *Locklin v. Switzer Bros., Inc.*, supra at 165-66.

Defendant Switzer, therefore, has the burden of showing the following in order to establish that Radiant is in civil contempt of this Court's injunction.



1. A simple, clear, reliable test for an ordinary chemist to perform and one which does not require extensive experimentation to show whether the accused resin contains sufficient melamine to render it substantially insoluble in aromatic hydrocarbon solvents.

2. That in fact the accused resin contains sufficient melamine to render it substantially insoluble in aromatic hydrocarbon solvents.

In order to sustain this burden, Switzer relies on two different kinds of tests: (1) the quick *qualitative* test, which was the test used at the original infringement trial and (2) the *quantitative* test.

### *Qualitative Tests*

In the qualitative tests, Switzer manufactured and used a resin consisting of a co-condensation reaction of melamine, sulfonamide and formaldehyde in the same mole proportions as in the accused 4-C resin (i.e., 7 moles of formaldehyde, 4 moles of sulfonamide and 1 mole of melamine). Switzer eliminated entirely the one-half mole of urea from the test resin in order to show that there was sufficient melamine, without the urea, to render the resin substantially insoluble in aromatic hydrocarbon solvents.

Switzer conducted two qualitative tests. The first test was conducted on September 25, 1965, at Cleveland, Ohio, in the presence of Radiant. On that date, Switzer placed a measured quantity of its test resin in separate containers each holding one of the three aromatic hydrocarbon solvents—benzene, toluene and xylene.

The second test was conducted at trial, at which time Switzer placed a roughly measured quantity of its test resin in containers holding each of the aforesaid hydrocarbon solvents.

Both parties are in agreement that, if a finely ground resin is placed in an aromatic hydrocarbon solvent and it stays suspended without coalescence or agglomeration, then this is an indication that the resin is insoluble, while if the resin becomes coalesced or agglomerated, then this is an indication that the resin is not insoluble. There is dispute, however, over how long the resin must remain suspended without coalescence or agglomeration to come within the defining words of the patent claim: "substantially insoluble in aromatic hydrocarbon solvents."

At the original trial in 1959 before Judge Goodman, the Court considered only tests in pure toluene in determining whether the resin was substantially insoluble in an aromatic hydrocarbon solvent. Furthermore, at the original trial, the lapse of time between the date when the resin was placed in toluene and the date when the observations of the condition of the resin in the toluene were made, was less than one week.

Switzer demonstrated during this contempt hearing that its test resin remained free flowing and dispersed 24 hours after being placed in the pure solvents. Switzer also demonstrated at the trial that the resin placed in the solvents on September 25, 1965, which had stood unshaken for 17 days, was free-flowing upon being shaken at the trial.

Radiant also made a number of test resins and conducted tests thereon in the pure solvents. One resin made by Radiant, designated JS-739, contained the following ingredients in the indicated mole proportions: 7 moles of formaldehyde, 4 moles of sulfonamide, 1 mole of melamine and one-half mole of urea. Another resin manufactured by Radiant, designated JS-738, contained the same ingredients except the urea.

At the trial, Bennahmias, Technical Director of Radiant, testified (RT 404 et seq.) that on July 13, 1963, more

than two years prior to trial, he placed a JS-738 resin in a container of benzene (Radiant's Exhibit No. 43) and that on July 28, 1963, he placed a JS-738 resin in a container of toluene (Radiant's Exhibit No. 44). Mr. Bennahmias then testified about the results of these 1963 tests. However, because these tests were not conducted under the observation of Switzer, as were later tests conducted by Radiant on September 3, 1965, and in light of the conflict in results between these tests and those conducted on September 3, 1965, the Court considers the latter tests more reliable.

In the inter-parties test in Richmond, California, held on September 3, 1965, Bennahmias testified that he placed a measured quantity of the JS-738 resin in containers of benzene (Radiant's Exhibit No. 17), toluene (Radiant's Exhibit No. 18) and xylene (Radiant's Exhibit No. 19).

The JS-738 resin, which was placed in benzene on September 3, 1965 (Radiant's Exhibit No. 17) was introduced in evidence by Radiant and appeared to be agglomerated at the time of trial. But the JS-738 resin, which was placed in the toluene on September 3, 1965, (Radiant's Exhibit No. 18) was free flowing—notwithstanding Mr. Bennahmias' statement that he thought it was partly agglomerated (RT 418). Further, the JS-738 resin, which was placed in xylene on September 3, 1965, (Radiant's Exhibit No. 19) was also free-flowing at the time of trial.

Radiant relies greatly upon the test which showed that on the date of trial, the JS-738 resin, which had been placed in *benzene* on September 3, 1965, appeared to be agglomerated.

However, all resins of this type will eventually agglomerate in any pure aromatic hydrocarbon solvent. The stronger the solvent the less time it will take to ag-

glomerate. According to the testimony of Dr. Von Fischer, and certain publications introduced at trial (RT 220-225), benzene has a very high solvent power, is the most volatile of the aromatic hydrocarbon solvents, is quite toxic and is not generally employed as a solvent in paint vehicles of the type herein used. Since benzene is the strongest of the three aromatic hydrocarbon solvents, a resin should agglomerate in it first.

Further, the testing of a resin in any pure aromatic hydrocarbon solvent is merely an indication of the substantial insolubility of the resin in a paint vehicle.

The mere fact that resin agglomerates within four or more weeks in a pure hydrocarbon solvent, such as benzene, does not necessarily indicate that the resin will agglomerate in a paint vehicle in the same period of time. Pure hydrocarbon solvents are never used alone with resin in a paint vehicle, but only in conjunction with other liquids and substances which in effect reduce the strength of the pure solvent.

Thus, in a paint vehicle the resin will actually remain insoluble for a considerably longer period of time than in a pure solvent.

As demonstrated at trial by Switzer, resins made up in accordance with the examples in the Kazenas patent have remained free-flowing and dispersable in the paint vehicles for longer than five years (RT 102-113).

Mr. Bennahmias, testifying for Radiant, admitted at trial that tests of 48 hours and one week are indications that the pigment can be used satisfactorily in paint vehicles (RT 483)—although Radiant used other tests as well (RT 491).

The Court finds, therefore, that the benzene test conducted by Radiant, showing its JS-738 resin to have agglomerated in benzene after approximately seven weeks,

does not disprove that the accused resin contains sufficient melamine to render it substantially insoluble in aromatic hydrocarbon solvents.

The Court finds no merit in Radiant's contention that the results are not reliable because of certain differences between the kind of melamine Switzer used in its qualitative tests and that used by Radiant, and because of certain differences in the method of preparation of the test resin by Switzer.

It is, therefore, the finding of the Court that, when taken together, the 24 hour and 17 day qualitative tests conducted by Switzer, and the qualitative tests conducted by Radiant which showed that their JS-738 resin was free flowing and dispersed in toluene and xylene after approximately seven weeks, are simple clear reliable tests, which demonstrate that, in fact, the accused 4-C resin contains sufficient melamine to render it substantially insoluble in aromatic hydrocarbon solvents.

The Court, however, in no wise suggests that the above tests represent the minimum standard for determining the question presented or that the 24 hour qualitative test, alone, would not suffice for determining the question here. The Court merely holds that the above tests when considered together do in fact show beyond any doubt that the accused 4-C resin contains sufficient melamine to render it substantially insoluble in aromatic hydrocarbon solvents.

In addition to the above qualitative tests made by Switzer, Switzer also made a 24 hour quantitative test. In this test a carefully measured portion (.10 grams) of the JS-738 resin (which was a sample resin made by Radiant but without any urea) was deposited in 50 milliliters of each of the three pure solvents. In addition, a carefully measured portion of the JS-739 resin (also a sample made by Radiant but containing a half-mole of



urea) was deposited in 50 milliliters of each of the three pure solvents.

After allowing all of these solutions to stand for 24 hours, Switzer determined how much of the resin had gone into solution, i.e., the solubility. Switzer determined that in benzene, .020 grams of the JS-738 resin had dissolved per 100 milliliters of benzene, while .010 grams of the JS-739 resin had dissolved per 100 milliliters of benzene. In toluene, Switzer determined that .007 grams of the JS-738 resin had dissolved per 100 milliliters of toluene, while .002 grams of the JS-739 resin had dissolved per 100 milliliters of toluene. In xylene, Switzer determined that .003 grams of the JS-738 resin had dissolved per 100 milliliters of xylene, while .002 grams of the JS-739 resin had dissolved per 100 milliliters of xylene.

It appears, therefore, that in the 24 hour period only very minute quantities of the JS-738 resin and of the JS-739 resin went into solution.

Although these quantitative tests were not before the Court in the original infringement trial in 1959, the Court finds that the results of the quantitative tests with the JS-738 resin substantiate the findings of this Court with regard to the qualitative tests, to wit: that the accused 4-C resin contains sufficient melamine to render it substantially insoluble in aromatic hydrocarbon solvents.

Radiant's basic contention has been that the amount of melamine alone in the condensation product of formaldehyde, sulfonamide and melamine is insufficient to render the product substantially insoluble in aromatic hydrocarbon solvents and that its "4-C resins are rendered substantially insoluble in aromatic hydrocarbon solvents by using urea in addition to melamine, the urea being an essential ingredient without which the condensation product will agglomerate." *Radiant's Pre-Trial Brief*, p. 4.



The Court has already found that the amount of melamine by itself in the accused 4-C resin is sufficient to render it substantially insoluble in aromatic hydrocarbon solvents.

Tending to further confirm this finding is the fact that the record before us indicates that, not only is the amount of melamine sufficient to render the condensation product substantially insoluble in aromatic hydrocarbon solvents, but also that the additional urea, itself, has little or no effect in producing such substantial insolubility.

The Court recognizes that the question whether the urea produces or tends to produce the substantial insolubility of the accused 4-C resin in the aromatic hydrocarbon solvents is *not* the determinative issue referred to this Court by the Court of Appeals.

Radiant, therefore, is under no obligation to demonstrate that it is the urea which produces the substantial insolubility of its 4-C resin in the aromatic hydrocarbon solvents. Rather, the burden of proof is upon Switzer to prove that, whatever the effect of the urea may be, the amount of melamine, alone, in the accused 4-C resin is sufficient to render it substantially insoluble in the aromatic hydrocarbon solvents.

Nevertheless, evidence tending to show that the urea has no effect, so far as the 4-C resins are rendered substantially insoluble in aromatic hydrocarbon solvents is concerned, tends to confirm the Court's finding that it is the melamine, alone, which renders the accused 4-C resin substantially insoluble in the aromatic hydrocarbon solvents.

In this connection, the record shows that, although Radiant introduced in evidence the containers of benzene, toluene and xylene with the JS-738 resin (without urea), it did not introduce in evidence the containers of benzene,

toluene and xylene which had the JS-739 resin (with urea) deposited in them on September 3, 1965, at the interparties test at Richmond, California.

It then became necessary for Switzer to introduce in evidence the container of benzene with the JS-739 resin (with urea). The Court examined this container of benzene with the JS-739 resin (with urea) and it appeared that this JS-739 resin (with urea) was in the same agglomerated condition as the JS-738 resin (without urea) and Bennahmias so admitted (RT 472).

If, as contended by Radiant, that its "4-C resins are rendered substantially insoluble in aromatic hydrocarbon solvents by using urea in addition to melamine", then it would seem that the agglomeration of the JS-739 resin (with urea) in benzene after approximately seven weeks demonstrates that the addition of urea had no apparent effect on the 4-C resin.

Our conclusion is that (1) either Radiant's contention that its "4-C resins are rendered substantially insoluble in aromatic hydrocarbon solvents by using urea in addition to melamine" is wrong or (2) the benzene tests which showed that after seven weeks the JS-738 resin (without urea) and the JS-739 resin (with urea) had agglomerated do not disprove that either resin is substantially insoluble in aromatic hydrocarbon solvents.

The Court has already found that the benzene test conducted by Radiant, showing its JS-738 resin to have agglomerated in benzene after approximately seven weeks, does not disprove that the accused resin contains sufficient melamine to render it substantially insoluble in aromatic hydrocarbon solvents.

After a review of the entire record, as discussed in this opinion, the Court finds, in answer to the question presented here, that in the 4-C resin, the amount of melamine

utilized is such as to bring the resin within the limits of the claims of the Kazenas patent as those claims are delineated in *Locklin v. Switzer Bros., Inc.*, 299 F.2d 160 (9th Cir. 1961).

This Memorandum of Decision contains the Findings of Fact and Conclusions of Law as required by Fed. R. Civ. P. 52.

Dated: February 17, 1966.

W. T. Sweigert  
United States District Judge